MINING WORLD

in this issue

Kennecott Pits the Ray

Poge 26

Vol. 15 No. 1

JANUARY, 1953

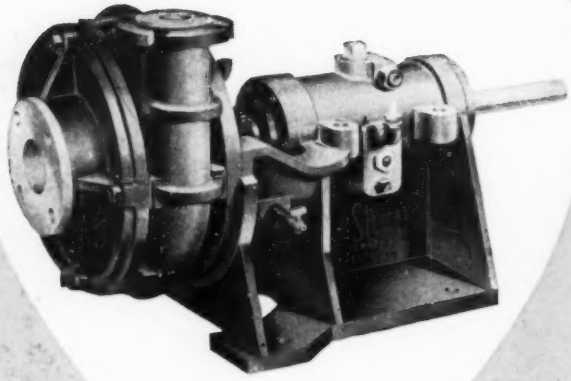
35 cents a copy
In sterling 3s

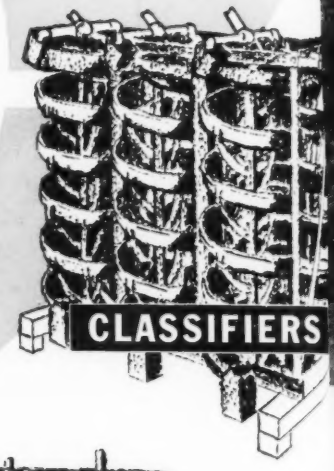
NEW ROADS
to the mines are easy digging and loading jobs for Eimco 104's. Production loading, maintenance on roads, digging ditches or general cleanup around the plant — the 104 does all jobs well.
EIMCO
A425
THE EIMCO CORPORATION
The World's Largest Manufacturers of Underground Rock Loading Machines
EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 10, UTAH, U. S. A.
BRANCH SALES AND SERVICE OFFICES
NEW YORK 51-53 SOUTH STREET • CHICAGO 5179 SOUTH WALLACE STREET
BIRMINGHAM, ALA. 3140 FAYETTE AVE. • DULUTH, MINN. 216 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIF. 637 CEDAR STREET
KELLOGG, IDAHO, 207 DIVISION ST. • LONDON W. 1, ENGLAND, 190 PICCADILLY
IN FRANCE, SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND, EIMCO, GREAT BRITAIN, LTD., LEEDS 12, ENGLAND
IN ITALY, EIMCO ITALIA, S.P.A., MILAN, ITALY

THE HEART OF THE PROCESS

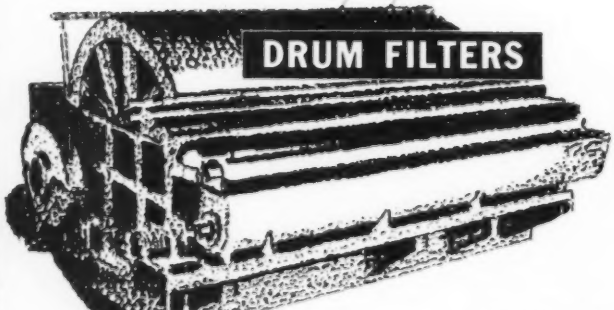
Proper functioning of each component in a process depends on the kind of steady performance that you get from Hydroseal Pumps . . . and the kind of experience that assures the proper application of control equipment. Ask an operator who uses Hydroseals. Then ask our engineers to help you.

CYCLONES

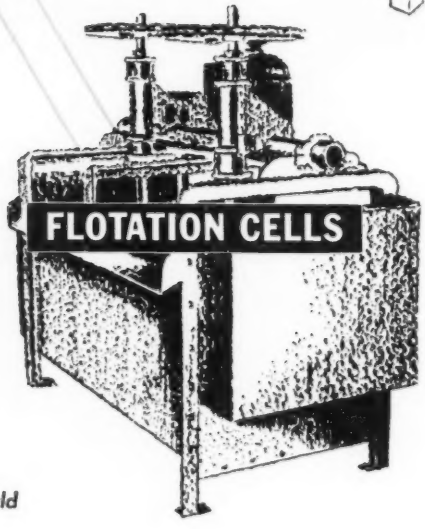




CLASSIFIERS



DRUM FILTERS



FLOTATION CELLS

Representatives throughout the World

THE ALLEN-SHERMAN-HOFF PUMP CO., Dept. J—259 E. Lancaster Ave., Wynnewood, Pa.

HYDROSEAL SAND, SLURRY & DREDGE PUMPS
MAXIMIX RUBBER PROTECTED

HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD

MOVING A MOUNTAIN OF IRON

JUST before winter locks the Great Lakes, mountains of iron ore hit the docks for shipment and must be stockpiled in a hurry. To handle this rough, rush job for the Pittsburgh Dock Co., A. J. Baltes, Inc., of Norwalk, Ohio, uses a Caterpillar Diesel DW20 Tractor and No. 20 Scraper, push-loaded with a D8 track-type Tractor.

"I like the long-life performance of Caterpillar equipment," foreman K. H. Myers says. His earthmovers are on the go 10 hours a day handling this iron ore, hauling 24-ton loads a half mile, 7 or 8 trips an hour. "And I like their economy, too," he adds, for his DW20 wheel-type Tractor needs only about 45 gallons of fuel a day, *one-half* the consumption of another manufacturer's unit on the same job.

There's extra power and capacity built into the Caterpillar DW20 Tractor and No. 20 Scraper team. The 225-HP Diesel engine in the tractor is precisely balanced with the 20-cu.-yd. heaped capacity of the scraper to give sustained, long-haul, high-speed, low-cost service. The scraper, with a flat, double-bottomed bowl, is cable-operated for fast, sure loading and spreading. And this is a *safe* rig, too: anti-jackknife devices, large air-actuated brakes and power steering give operators complete control and cut down-time due to damaged equipment.

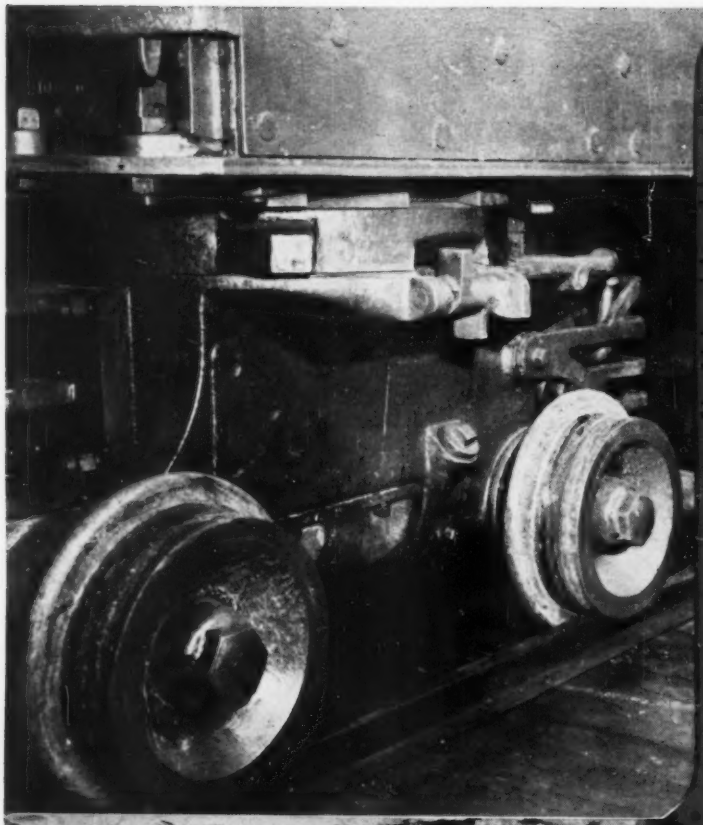
Your Caterpillar Dealer will be glad to demonstrate. And remember, only genuine Cat parts can give you the genuine Caterpillar quality that's built into every one of these big yellow machines.

Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT



hugs the rails...

to hustle your loading

...with safety

Gardner-Denver Mine Car Loaders are fully described in Bulletin MCL. Send for your copy today!

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois, U.S.A.

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

USED TO DESTRUCTION...NO RESHARPENING

Liddicoat

. . . the bit that drills farther, faster, for less

Liddicoat detachable bits are used to destruction and then discarded. The strong connection — no threads — provides good steel life and makes the changing of bits quick and easy. No delays, no resharpening, no extra costs.

With Liddicoat's low initial cost, you obtain lowest cost per foot of hole drilled.

Liddicoat bits actually chip out the rock instead of battering it until pulverized as is the case with ordinary conventional bits. The two-stage cutting portions for the life of the bit are the principal reasons for this stand-out performance of Liddicoat. The cutting edges are shaped for drilling speed and the reaming edges for long use.

Many of the world's most important mining and contracting companies have turned to Liddicoat for superior performance. Join this ever-expanding list of satisfied Liddicoat customers.

PILOT CONSTRUCTION

Section "AA", along the high-centre wings. Section "BB", along the low-centre wings.

WESTERN
Rock Bit Manufacturing Company

552 West 7th South • Salt Lake City 4, Utah

EVERY LITTLE BIT COUNTS

MINING WORLD, January, 1953. Volume 15 No. 1. Published monthly, except April when publication is semi-monthly, at Emmett St., Bristol, Conn. Executive, advertising and editorial offices, 121 Second St., San Francisco 5, California. Subscription in United States, North Central and South America, $3.00 per year; other countries, $4.00 per year. Entered as second class matter Oct. 10, 1951 at the Post Office at Bristol, Conn., under the act of March 3, 1879. Postmaster: please send notice 3579 to MINING WORLD, 71 Columbia St., Seattle 4, Washington.

UNDERGROUND, OR . . .

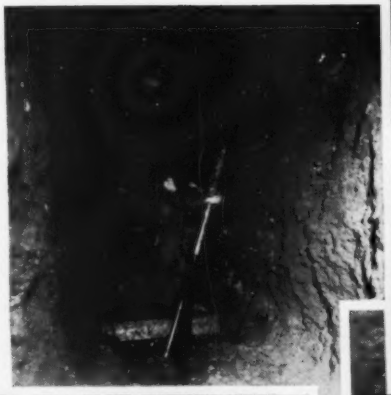
IT'S JOY EQUIPMENT

Right: The Joy Drillmobile, a twin-boom, self-propelled, highly maneuverable machine, gives you maximum footage at least cost per foot of hole. Features Joy Hydro Drill Jibs for fast, accurate hole-positioning, and remote control.

Above: For high-production loading and haulage of rock and ore, Joy teams of trackless loaders and electric or diesel shuttle cars get the call underground.

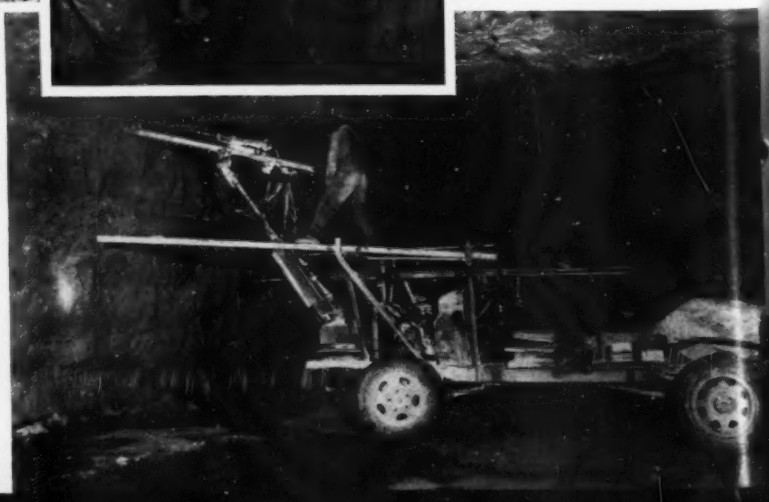
Right: Complete range of Joy Stopers includes the new S-91T, with telescopic feed. Requires fewer steel changes, gives more time for drilling.

Below: Joy Wagon Drill specially adapted to drill at any height from toe-holes to horizontals 9' high.



Left: The Joy HS-15 high speed drill for underground blast holes, or core drilling to 500'. Compact and easy handling, with "in-line" vibrationless drive.

Below: Joy Hydro Drill Jibs are versatile units; can be mounted as required to suit individual needs. This truck-mounted Jib is an example.

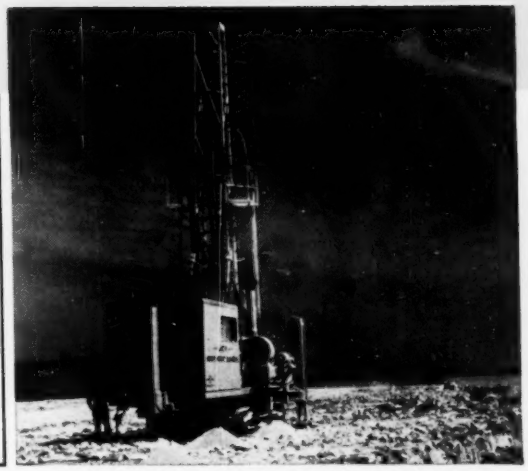


. . . ON THE SURFACE

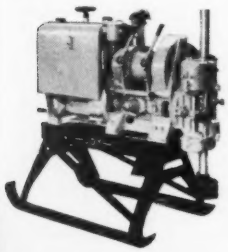
FOR GREATER TONNAGE
FOR LOWER COSTS

Above: Joy builds a complete line of "Silver Streak" Hand Tools, cadmium-plated for rust protection and easier running in.

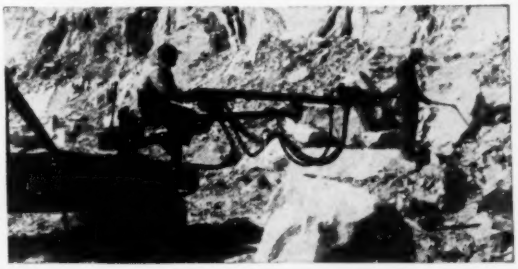
Above: Joy Wagon Drills (Medium and Lightweight models) are easily maneuvered units with positive locking brakes for quick set-ups and balanced drilling on any terrain.



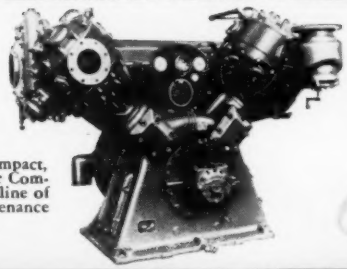
Above: Joy Champion Rotary Drills set absolutely new standards in high-speed, economical blast hole drilling, far outperforming all others. Built in two self-propelled models, for diesel, gasoline engine or electric motor drive.



Above: Joy Core Drills range in capacity from 250 to 1750 feet of 1½" hole. Screw feed or hydraulic types—gasoline, diesel, air or electric drive.



Above: Joy Hydro Drill Jibs are readily adaptable to truck-mounting, etc. for secondary drilling or toe-holes in quarries or open-cut mining.



Left above: Joy's popular Series 80 Portable Compressors, with the famous "Econo-Miser" load control, are built in seven sizes, from 60 to 630 CFM.

Right: Joy pioneered the compact, modern "package-type" Air Compressor—offers a complete line of highly efficient, low maintenance airplants up to 3656 CFM.

Consult a Joy Engineer

W&D M-3363

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

EIMCO 2-Speed AIR LOCOMOTIVE

for
- SMALL MINES
- CONSTRUCTION JOBS
- GATHERING
- EXPLORATION DRIFTS
- SWITCHING
- and many other uses

The Eimco Air Locomotive is the answer to economical car handling underground. Eimco has developed the first two-speed, constant-mesh transmission to be used on any air locomotive. Starting in low gear to get the load in motion you shift immediately into high gear.

ADVANTAGE

This means you get more haulage distance per cubic foot of air consumed.

There are many other advantages in the Eimco Air Locomotive. Here are a few:

1. Longer hauls with greater load. 2. Two speeds forward and reverse. 3. Neutral for free wheeling. 4. Articulating axle assembly. 5. Efficient Eimco made air motor. 6. Registered ASME code receiver. 7. Parking brake. 8. Safety centering throttle.

EIMCO A421

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 10, UTAH, U. S. A.

BRANCH SALES AND SERVICE OFFICES:

NEW YORK 51-52 SOUTH STREET • CHICAGO 3319 SOUTH WALLACE STREET
BIRMINGHAM, ALA. 3140 FAYETTE AVE. • DULUTH, MINN. 216 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIF. 637 CEDAR STREET
KELLOGG, IDAHO, 307 DIVISION ST. • LONDON W. 1, ENGLAND, 190 PICCADILLY.

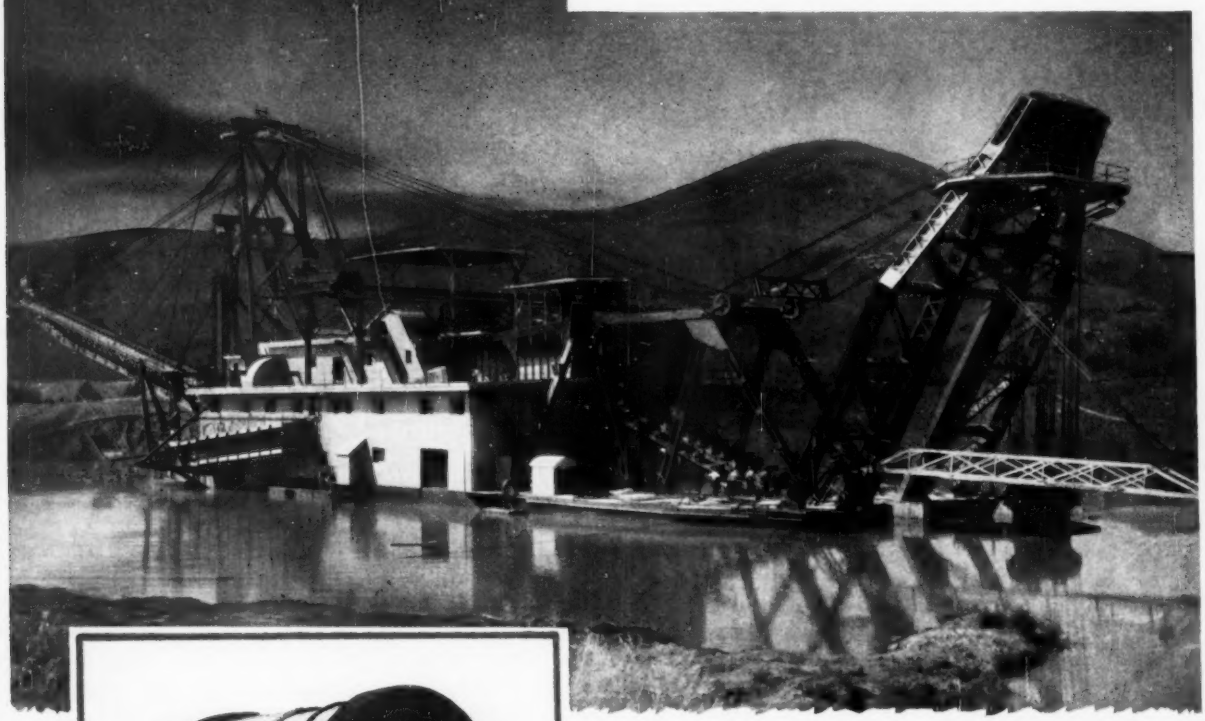
IN FRANCE: SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND: EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
IN ITALY: EIMCO ITALIA S.P.A., MILAN, ITALY

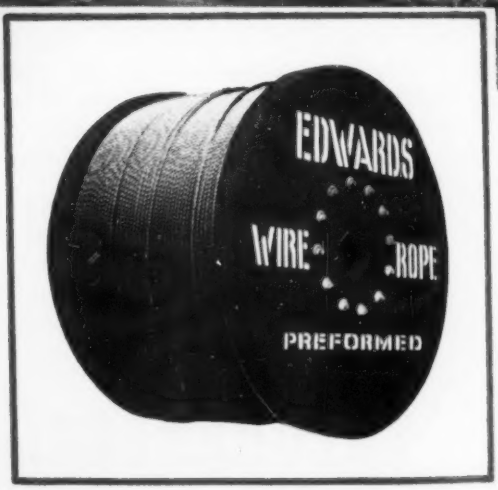
Rig for profitable dredging

with Edwards Wire Rope

To get the tough, durable wire rope required for safe, continuous operation specify Edwards Wire Rope for bow lines, guy lines, stacker lines, stern lines—for all lines used in dredging.

There's an Edwards rope in the size, grade and construction you need for every mining job, whether on dredging, shaft or open pit operation. Select the *right* rope from the complete Edwards line.





EDWARDS WIRE ROPE

E. H. EDWARDS COMPANY

General Office: **South San Francisco, California**

Los Angeles • Houston • Seattle • Portland

Self-loading D Tournapull cuts man hrs.

Self-loading slacked shale at an old coal mine dump. D Tournapull heaps 5 bank yds. in slightly over 1 minute. Distance, 200 ft.

Tournapull averages 21 m.p.h. on 2100-ft. haul from pit to plant. Rig can cross railroad tracks, pavement, without damaging surface.

Acme Brick Company, Fort Worth, used to need *17 man-hours* to supply daily requirements of 250 tons of slacked shale to their plant at Bridgeport, Texas. Now, with a self-loading D Roadster Tournapull replacing their dump truck and front-end loader, 1 man and 1 machine do the same job in only *4¼ man-hours* — a saving of 75%.

Delivers 55 yds. of shale hourly on 4200-ft. cycle

The "D" is working the same pit as did the truck and loader — but where the 2 units moved less than 30 tons an hour, the Tournapull, working alone, delivers 60 tons. In typical operation, the "D" self-loads 5 bank yds. of shale . . . hauls 4/10 miles to crusher bin . . . dumps . . . and returns 4/10 mile to the pit. The complete 4200′ cycle takes only 4½ minutes. Eleven loads (55 bank yds.) are delivered every 50-minute hour.

"Like the way it handles"

In 2,000 hours of this year-'round work, the Tournapull has been 90% mechanically efficient. "I like the way the D Roadster handles," says Operator W. D. Stubblefield. "The controls are easy to operate, and the truth is I just prefer this machine to any other I have ever operated."

Order 3 more "D's" on basis of this performance

Acme bought this electric-control Tournapull in August, 1950 . . . liked it so much they have purchased 3 more since then for work at their plants in Malvern, Arkansas; Clinton, Oklahoma; and Baton Rouge, Louisiana. District Supt. Ray Ivey reports these 4 rigs go everywhere under their own power. One "D", for example, drove 500 miles in about 2 days from Garrison, Texas, to Clinton.

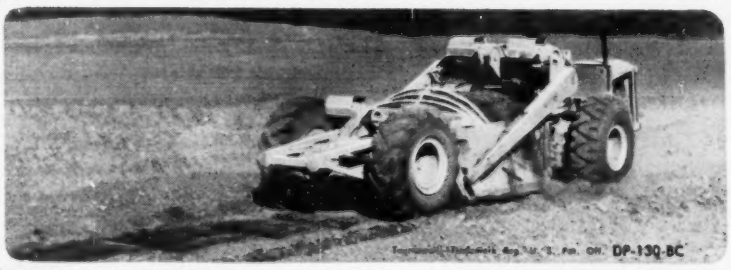
These high speeds on the job and between jobs might be the answer to a lot of *your* problems, too. Ask your Le-Tourneau Distributor to show you more facts on performance . . . price . . . and delivery so you can judge for yourself. He will be glad to arrange a demonstration for you. Call him any time . . . there's no obligation.

R. G. LeTOURNEAU, INC.

Peoria, Illinois

for shale supply 75%

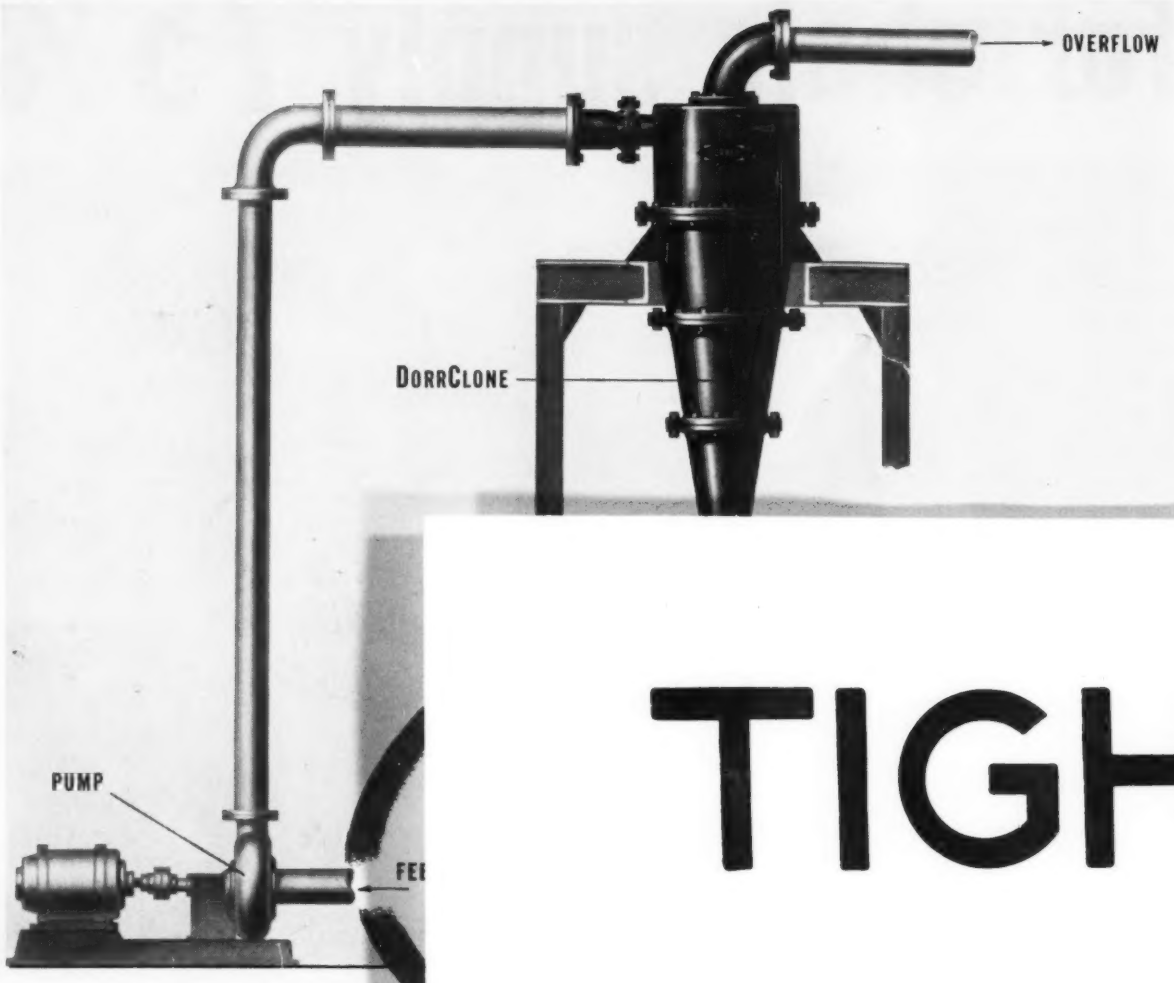
Shale is dumped through grizzly into crusher bin. With Tournapull supplying all basic material — usually in 4 to 4½ hours of work — plant output averages 100,000 bricks, or 200 tons of building tile, daily. Tournapull uses its spare time to strip waste from a new pit.



With big 18.00 x 25 low-pressure tires, the D Tournapull has plenty of traction for self-loading loose slacked shale. Tires roll over material, do not grind *through* it, like tracks.

DP-130-BC

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT



TIGHT

BOU

PROBLEM — *To make a 200 mesh high-solids content iron ore . . . w lution.*

RESULT — *Extensive test work o DorrClone resulting in an order fo 24" units.*

At Cleveland Cliffs Iron Comp Washer, a 24" dia. DorrClone was installed on a test basis to determine the desirability of desliming their classifier overflow prior to conventional fine ore treatment. Standard hydroseparation was impossible without considerable dilution as these overflows contained a high percentage of solids.

The DorrClone was required to make a satis- little effect on the operation . . . the DorrClone operated very satisfactorily."

If you have a desliming problem, there's a good chance that the DorrClone, with its high capacity-for-size and ability to handle flocculant or heavy pulps, will be the solution. For further information write for bulletin No. 2500. The Dorr Company, Stamford, Conn.

*Trademark of The Dorr Company

Better tools TODAY to meet tomorrow's demand

DORRCO

DORR

WORLD - WIDE RESEARCH · ENGINEERING · EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

Offices, Associated Companies or Representatives in principal cities of the world.

ATED!

for the hardest years ahead

HTLY

UND

P&H

NETORQUE*

Electric Swing puts you beyond the "clutches of wear"

Electric Swing — actually 15% to 25% faster than any other machine of its size to give you greater production, lower tonnage costs. And it's goodbye to maintenance and replacement problems for years to come . . . Magnetorque lasts the life of your P&H.

But to get fully acquainted with this outstanding producer, let us direct you to a 955-A in action. If you want bigger capacity, same advanced design, ask about the P&H 1055-A (3½ yd.)

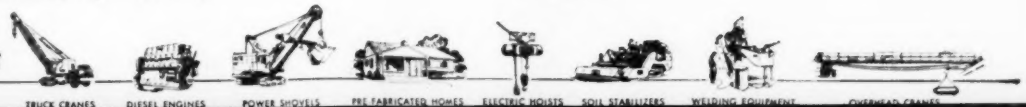
P&H LARGE EXCAVATOR DIVISION

HARNISCHFEGER CORPORATION

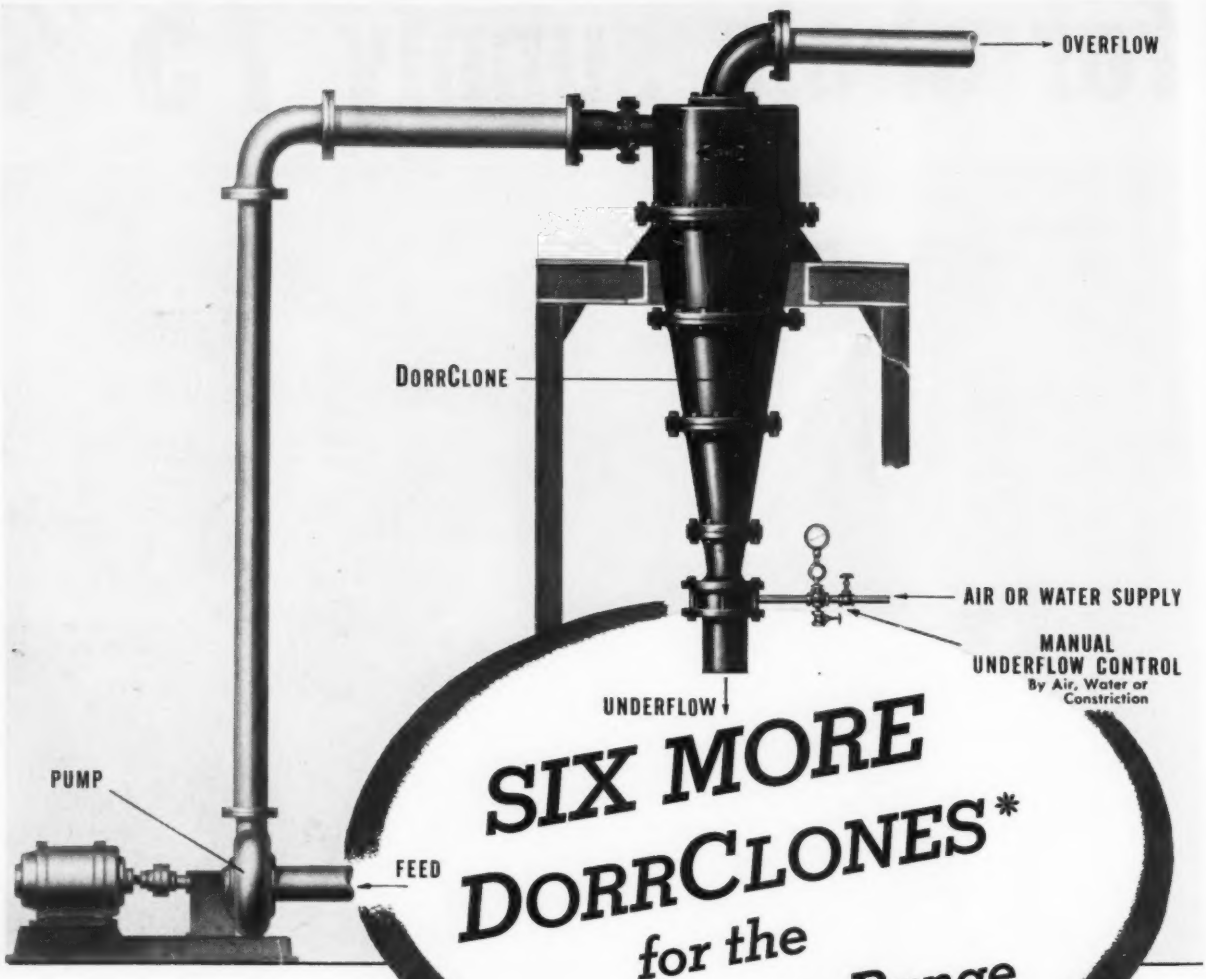
4400 W. NATIONAL AVENUE • MILWAUKEE 46, WISCONSIN

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

The P&H Line



TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES



SIX MORE DORRCLONES* for the Iron Range

PROBLEM — *To make a 200 mesh separation on a high-solids content iron ore . . . without prior dilution.*

RESULT — *Extensive test work on a 24" dia. DorrClone resulting in an order for six additional 24" units.*

At Cleveland Cliffs Iron Company's Canisteo Washer, a 24" dia. DorrClone was installed on a test basis to determine the desirability of desliming their classifier overflow prior to conventional fine ore treatment. Standard hydroseparation was impossible without considerable dilution as these overflows contained a high percentage of solids.

The DorrClone was required to make a satisfactory size separation on feeds varying widely in both percent solids and structure. During the tests, solids varied from 17-35% and +200 mesh in feed varied from 25-35%. The Beneficiation Engineer at Canisteo reported that "after initial adjustments, these variations seemed to have little effect on the operation . . . the DorrClone operated very satisfactorily."

If you have a desliming problem, there's a good chance that the DorrClone, with its high capacity-for-size and ability to handle flocculant or heavy pulps, will be the solution. For further information write for bulletin No. 2500. The Dorr Company, Stamford, Conn.

*Trademark of The Dorr Company

Better tools TODAY to meet tomorrow's demand

DORRCO

DORR

WORLD - WIDE RESEARCH · ENGINEERING · EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.
Offices, Associated Companies or Representatives in principal cities of the world.

ROCK RATED!

for the hardest years ahead

Your profits depend on the strength and speed of loading equipment — and P&H gives you more of *both*.

P&H *greater strength* comes from welded alloy steels — the toughest construction known. No wonder P&H can take pounding and shock loads that K.O. less rugged machines.

P&H *greater speed* comes from Magnetorque* Electric Swing — actually 15% to 25% faster than any other machine of its size to give you greater production, lower tonnage costs. And it's goodbye to maintenance and replacement problems for years to come . . . Magnetorque lasts the life of your P&H.

To get fully acquainted with this outstanding producer, let us direct you to a 955-A in action. If you want bigger capacity, same advanced design, ask about the P&H 1055-A (3½ yd.)

P&H MAGNETORQUE*

Electric Swing puts you beyond the "clutches of wear"

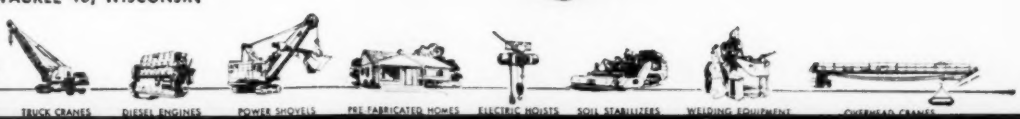
*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

P&H LARGE EXCAVATOR DIVISION

HARNISCHFEGER CORPORATION

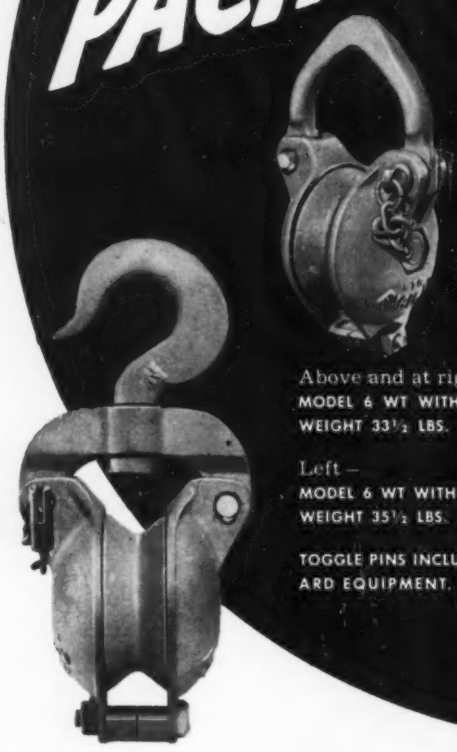
4400 W. NATIONAL AVENUE • MILWAUKEE 46, WISCONSIN

The P&H Line



Here's the NEW PACIFIC-

6" WIDE THROAT CARRYING BLOCK

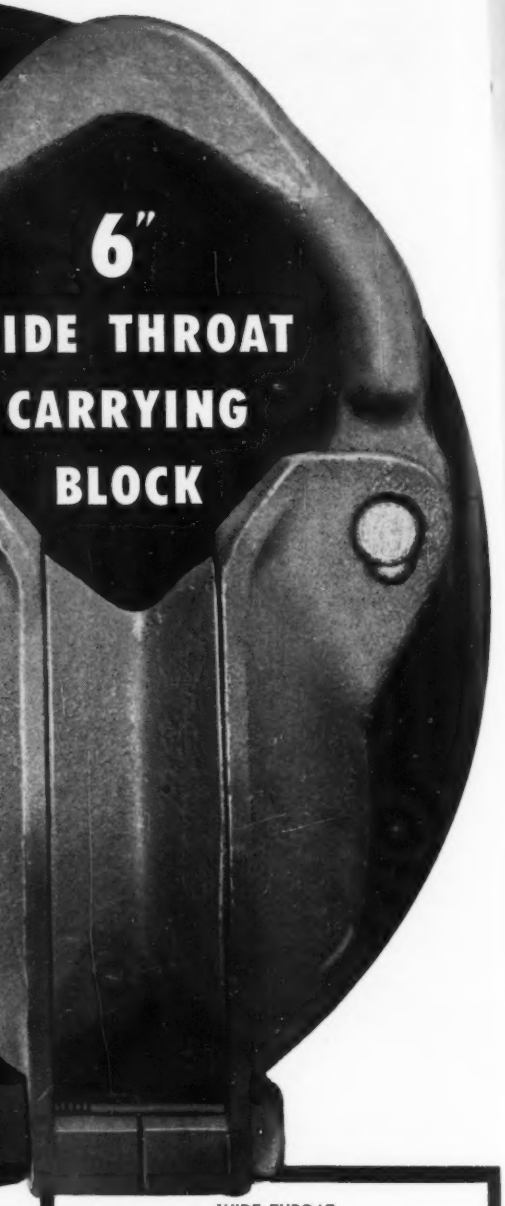


Above and at right –
MODEL 6 WT WITH SHACKLE
WEIGHT 33½ LBS.

Left –
MODEL 6 WT WITH HOOK
WEIGHT 35½ LBS.

TOGGLE PINS INCLUDED AS STANDARD EQUIPMENT.

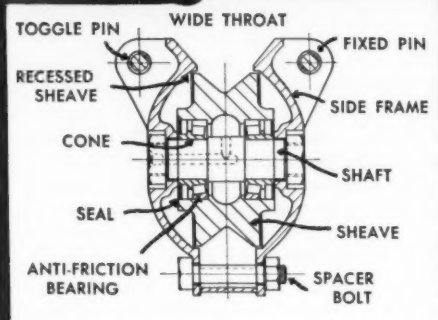
SPACER
IS INTEGRAL PART
OF SIDE FRAMES



These blocks will keep your tail ropes out of the muck. The wide throat of shackle suspended model will carry any size rope ordinarily used in slushing operations and will pass a 1⅛" square knot.

They're designed by men who know underground mining. Take one apart and you'll see why they'll *stay* underground ... and give you years of dependable, trouble-free service.

For complete information on this and the *complete line* of Pacific Sheave Blocks, send now for new bulletin No. 238.



Solid side frames. Extra-heavy construction of both groove and flanges. Made of heat-treated alloy steel for maximum toughness. Sheave is recessed into side frames to prevent rope fouling. Roller bearings are grease-sealed to prevent entrance of foreign matter.

ALLOY STEEL & METALS CO.

1848 EAST 55TH STREET, LOS ANGELES 58, CALIFORNIA

Mailing Address: Box 15323 Vernon Station, Los Angeles

LIMA type ... 2400

Lima Type 2400, equipped with 120 ft. boom, and 6 cu. yd. bucket.

SHOVEL CRANE DRAGLINE

FOR OPEN PIT MINING, QUARRIES and HEAVY CONSTRUCTION

The LIMA Type 2400 is a big, full mechanical clutch type shovel, dragline and crane with a combination of power, speed and stamina that gives complete satisfaction in all classes of work. It has been given the acid test for high output in rock and fast profitable operation in coal or metal mining. You will recognize at a glance, its heavy-duty engineering which means fewer delays on the job. You will like the smooth, efficient power that flows from its big husky diesel engine; the friction free drums and shafts that rotate on anti-friction bearings and the ease of control through air actuated clutches. These advantages and many more all add up to performance that pays off with fewer delays and bigger profits. You will like the Type 2400—6 yd. Shovel, 110 Ton Crane.

Baldwin-Lima-Hamilton Corporation
Construction Equipment Division
Lima, Ohio, U.S.A.

CAPACITIES: Shovels ¾ to 6 cu. yds. Cranes to 110 tons. Draglines, variable

Cable Address: LIMASHOVEL

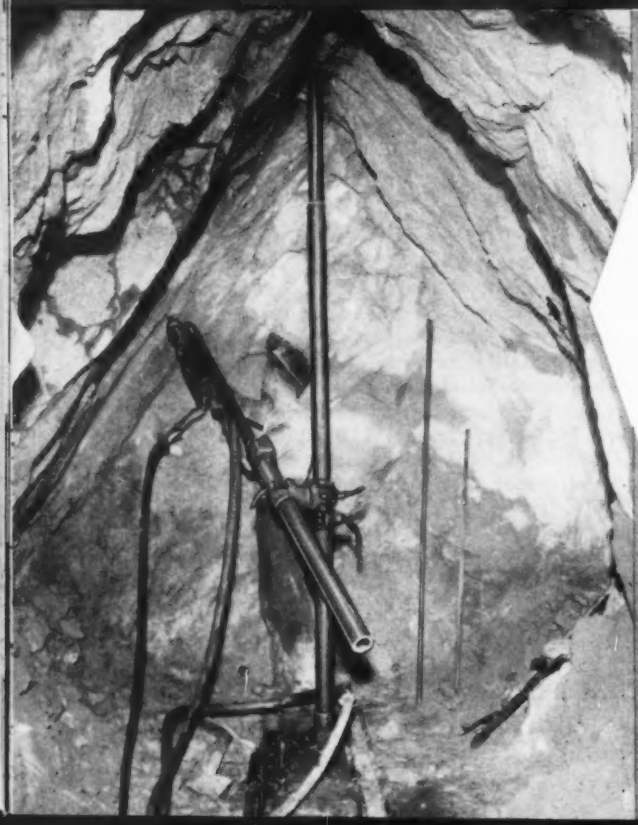
OFFICES IN PRINCIPAL CITIES OF THE WORLD

BALDWIN BLH LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

New! Speeds up



Miners like Le Roi-CLEVELAND HC23RW Reverse Air Feed Drifters

Management does, too

Faster Steel Changes! No swing or dump nuts to loosen and reset. Your miners simply swing drifter on feed cylinder and change steels. It's not only easy — it lets them drill out the round faster.

No Stuck Steels! Positive air feed keeps drills working at peak efficiency, avoids stuck steels.

Higher Drilling Speeds! Positive air feed plus proper force of blow and strong rotation give faster drilling speeds with both steel and tungsten carbide bits. You get longer bit life, too, and drill more footage.

Low Upkeep Cost! No feed screws or feed-screw nuts to wear. No complicated power-feed mechanism to give trouble.

Easy to Operate! Built to lighten the load on your miners. Feed controls conveniently located. Reverse air feed withdraws steel from hole quickly.

Faster Set-ups! The combination of Le Roi-CLEVELAND Air Feed Drifters and air columns gives you a unit that can be set up easily and quickly. And you can get the air column in any height you want.

drilling cycles

Le Roi-CLEVELAND *self-leveling* Mine Jumbo with four-foot steel-change Air Feed Drifter

Saves time drilling lifters! Lets your miners drill the right round for any ground!

You couldn't ask for more from a mine jumbo than the performance you get from this new Le Roi-CLEVELAND. It's got plenty of stuff. And the payoff for you is faster cycles, greater tonnage per man-shift, lower costs! Here's why:

Self-leveling, air-motor-powered arm, lets miners spot and space holes quickly and easily, for the most efficient fragmentation. They don't have to loosen a bolt or tilt a boom, to complete the drilling cycle.

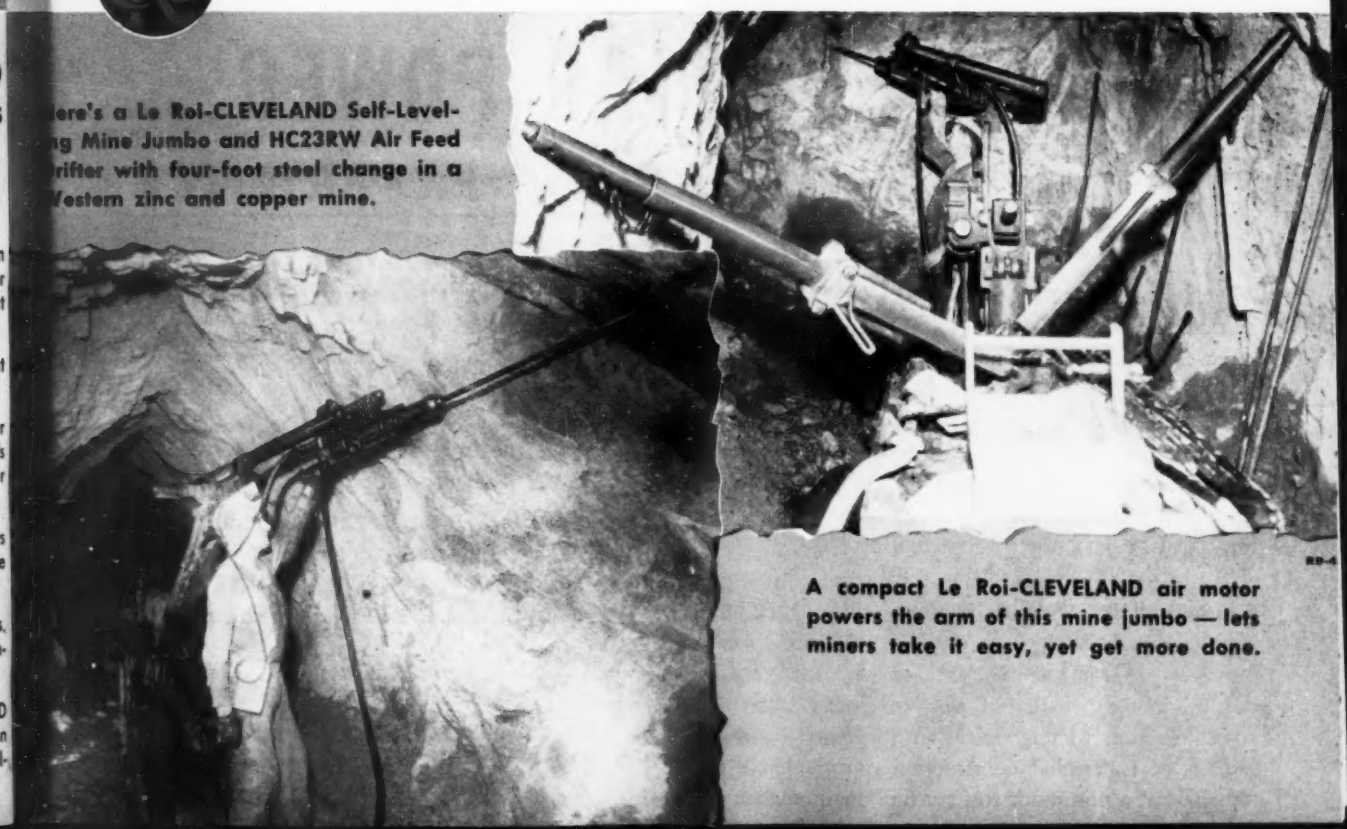
Exclusive rigid screw and gearing mechanism keeps the heading straight, cuts down overbreak and underbreak. Keeps the drifters in line, prevents the steel from binding, reduces chuck wear.

Offset arm provides plenty of clearance to drill lifters — without having to take time out to swing the drill under the arm.

You can get this Le Roi-CLEVELAND Self-Leveling Mine Jumbo in either single-arm or double-arm construction. Write for further information and see for yourself how either model can help you get more done every shift.

LE ROI COMPANY

CLEVELAND ROCK DRILL DIVISION
12500 Berea Road, Cleveland 11, Ohio
Plants: Milwaukee, Cleveland and Greenwich, O.



Here's a Le Roi-CLEVELAND Self-Leveling Mine Jumbo and HC23RW Air Feed Drifter with four-foot steel change in a Western zinc and copper mine.

A compact Le Roi-CLEVELAND air motor powers the arm of this mine jumbo — lets miners take it easy, yet get more done.

RD-4

CATERPILLAR POWER...

CHOICE OF EXPERIENCE

"I've operated Lorains for 40 years," says the veteran operator of this Lorain shovel for the Dulin Bauxite Co. of Sweet Home, Ark., "and Caterpillar power units have done the best under every condition." A Caterpillar D315 powers this ¾-yard shovel at the Dixson Pit near Sweet Home, which loads about 250 tons of bauxite daily. Material varies from fine grain to boulders the size of the shovel's bucket. The Cat D315 burns 1.6 gallons of low-cost fuel per hour without fouling.

Leading equipment manufacturers can supply Caterpillar Diesel Engines in the machines they build. Twelve sizes of engines to 500 HP and electric sets to 315 KW are available. Field records on the toughest, dustiest jobs prove that it pays to *specify* Caterpillar power for your mining operation. Simplicity and ruggedness of Caterpillar construction mean reliable performance at a minimum cost for fuel, maintenance and

All Caterpillar Dealers carry a large stock of factory replacement parts, because it takes genuine Caterpillar parts to give genuine Caterpillar performance. What's more, your nearby Caterpillar Dealer is standing by to provide on-the-job service 24 hours a day. Let him tell you about the Caterpillar line of Diesel Engines and Electric Sets. There's Cat power to fit your job.

CATERPILLAR TRACTOR CO., SAN LEANDRO, CALIF.; PEORIA, ILL.

CATERPILLAR

REG. U. S. PAT. OFF.

Diesel Engines
Electric Sets

MINING WORLD

A MILLER FREEMAN PUBLICATION

INCLUDING THE EXPORT EDITION WORLD MINING

Published monthly except in April when publication is semi-monthly

VOLUME 15 **JANUARY 1953** NUMBER 1

Capitol Concentrates 19
Drifts and Crosscuts 21
An Outlook for Mining in the Next Four Years 22
Dangers in the Antimony Situation 24
International Panorama 25
Kennecott Copper's Newest Big Open Pit 26
Idaho Beryllium & Mica Corp. Products Strategic Mica 31
Tungsten from King Island, Australia 34
More Electric Power for Belgian Congo 38
Money Making Methods 39
Northwest Mining Association Holds Record Conference 41
Vulcan Iron Works New Tandem Drum Slusher 45
The Lost San Antone Placers ..... by John D. Mitchell 50
Metal & Mineral Prices 82
The Wanderer 86

THE COVER CIRCLE: Kennecott Copper Corporation now trucks 13,000 tons of copper ore per day from its new Ray pit near Ray, Arizona. Production formerly came solely from the Ray underground block caving operations, which still account for 2,000 tons per day. Excessive water made surface operations necessary to recover ore beneath Copper Canyon.

PUBLISHING OFFICE

Emmett St. Bristol, Conn.

EDITORIAL AND EXECUTIVE OFFICES

121 Second St. San Francisco 5, Calif. GArfield 1-5887

General Manager, San Francisco M. F. HOLSINGER
Editor ..... GEORGE O. ARGALL, JR.
Field Editor ..... R. L. BURNS
News Editor ..... J. M. TAYLOR
Assistant News Editor ..... A. SENZEK
Product Editor ..... J. A. CHEESMAN
District Manager, Chicago ..... KAREL WEGKAMP
District Manager, New York ..... H. L. WALDRON
Production Manager ..... J. M. STALUN
Assoc. Editor, Vancouver ..... CHARLES L. SHAW

Branch Offices
New York 17 . 370 Lex. Ave., Murray Hill 3-9295
Chicago 26 ... 1791 Howard, Rogers Park 4-3420
Los Angeles 17, Calif. ..... 815 S. Witmer St. Dunkirk 9-1112
Vancouver, B. C. .. Royal Bank Bldg., MArine 7287

Published by
American Trade Journals, Inc.
Miller Freeman, President
L. K. Smith, Vice-President
W. B. Freeman, Publisher

REGULAR CORRESPONDENTS IN THE FOLLOWING CITIES AND MINING CENTERS:

Africa: Accra, Gold Coast; Costermansville, Belgian Congo; Johannesburg, Union of South Africa; and Kitwe, Northern Rhodesia. **Asia:** Ankara, Turkey; Benares, India; Kuala Lumpur, Federated Malay States; and Tokyo, Japan. **Europe:** Frankfurt, West Germany; Helsinki, Finland; London, England; Madrid, Spain; Paris, France; Redruth, Cornwall; Rome, Italy; Stockholm, Sweden; The Hague, Netherlands; and Trondheim, Norway. **North and Central America:** Mexico City, Mexico; San Jose, Costa Rica; and Vancouver, British Columbia. **Oceania:** Port Kembla, (N.S.W.) Australia. **South America:** Bernal, Argentina; La Paz, Bolvia; Lima, Peru; Quito, Ecuador; and Sao Paulo, Brazil.

Copyright 1953 by American Trade Journals Inc.

ABC

Contents may not be reproduced without permission

Mining World Subscription Rates

U. S. North, South and Central America $3.00
Other Countries $4.00
Single Copies ..... $ .35
Directory Number $2.00

WORLD MINING is published the 26th of each month as a regular department of MINING WORLD and is also circulated as a separate publication on a carefully controlled free basis to a selected list of management and supervisory personnel associated with active mining enterprises throughout the world.

GRAB SAMPLES From the Mail

Chief Geologist Keeps Informed

Dear Sir:

I have joined Elizade & Co., Inc. as geologist in charge of all geologic work in the mines operated by the company.

I am glad to inform you that **World Mining** is a very informative magazine and I find it a very useful reference for the mining industry. Please send it to me at my new address.

Carmelo T. Sison
Manila, Philippine Islands

Always Read with Interest

Dear Sir:

I consider **World Mining** an excellent publication and I am always interested in reading of mining developments in countries which are not usually covered by what might be termed "older" mining publications. I always pass my copy to a friend who also reads it with interest.

I might add that I don't know of any senior official here who does not receive the magazine.

T. D. Guernsey
Rhokana Corporation Limited
Nkana, Northern Rhodesia

An Arm Chair Voyage

Dear Sir:

I consider **World Mining** a geographical arm-chair voyage disclosing latest mineral discoveries and mechanized ingenuity employed in the development of the greatest field of lucrative commerce—mining around the globe.

Marcus Auerbach
Westmont, Quebec
Canada

Bird's Eye View—Global Mining

Dear Sir:

This company finds that **World Mining** gives an excellent "bird's eye view" of global mining, and because we are pioneers for underground mining of the local low grade ironstone a high degree of mechanization using a large proportion of machinery from the United States, cannot have too much information as to what the rest of the mining world is doing to extract treasures from Mother Earth in the most efficient manner.

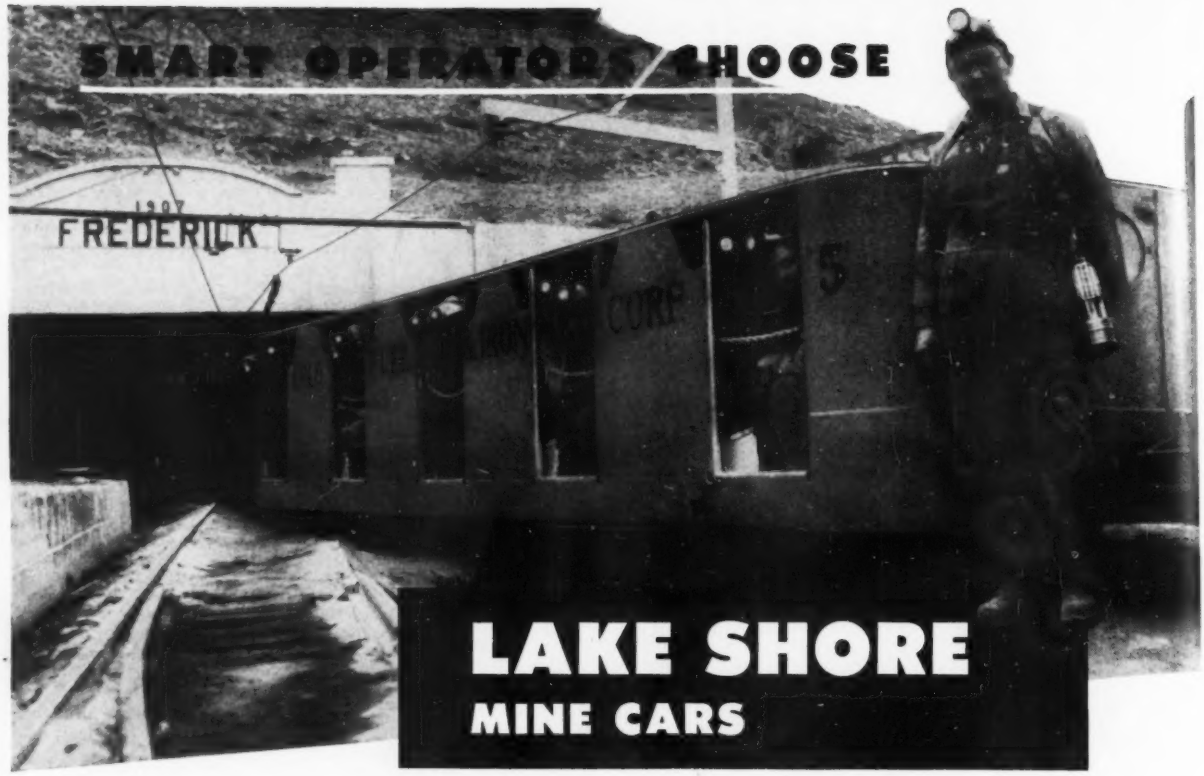
A. Alec Jones
Santon Mining Company Ltd.
Scunthorpe
England

Most Informative

Dear Sir:

We find that **World Mining** is most informative in every branch of mining, and we take great pleasure in reading it and learning from the articles published.

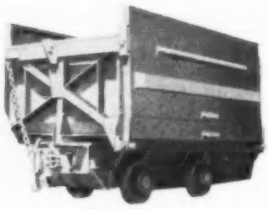
C. W. A. Ison
Central Wassau Gold Mines Limited
Secretary
Finsbury House
London, England



LAKE SHORE
MINE CARS

for a safe, smooth ride . . .

THAT'S what this Lake Shore Man Haul car (above) gives 30 men . . . a dry, safe, comfortable, upright ride with plenty of knee and headroom — space on the seats for dinner boxes. Enclosed design gives men full protection. Available insulated against electricity. Car equipped with full universal oscillating trucks, or conventional type.



for heavy loads and rough service . . .

250 cubic feet — the capacity of this tough, all-welded Lake Shore Granby type side dump car . . . designed for the extremely hard loading and operating conditions met in modern, high-production mining.

a standard of reliability . . .

This 38 cubic foot Lake Shore Standard side dump car has given years of trouble-free service in mines all over the country. Time-tested, simple, sturdy design.

Write for more information on Lake Shore "job-proven" Mine Cars and Mine Equipment.

Standard and Special
Mining-Milling Machinery for Every Application.

LOHED MINE CARS

JETO BOTTOM DUMP SKIP

BICYCLE SHEAVES

LAKE SHORE Engineering Company
IRON MOUNTAIN MICHIGAN

CAPITOL CONCENTRATES

WHAT WASHINGTON AGENCY HEADS WILL BE CHANGED?

There is unlimited speculation in Washington as to how far down the line the Republican shake-up may extend. Will it extend as far as the directors of the Bureau of Mines, Geological Survey, Indian Service, Bureau of Land Management, and others who are the makers and interpreters of government policy for the administration of the departments under their jurisdiction? It must be admitted that in recent years some of these departments have changed and become very Fair Dealish in their work.

The problem is complicated by the fact that many top jobs were included under the Civil Service and Classification Act, and thus are presumed to have some security against changes in administration. In other words, these appointments have been removed from the category of being "patronage" jobs. This was done deliberately as a hedge against a change in administration in the future. There is a definite feeling, however, that the changes in policy or administration of government agencies which have been demanded by the vote of the people require the makers and interpreters of those policies to be in line with the thinking of the new administration.

The Republican National Committee is urging the resignation of appointees whose terms have not yet expired in order to make room for others who may be expected to faithfully carry out the administration's ambitions and desires. These positions have always been regarded as "patronage" jobs in spite of the effort to plant New and Fair Deal policies deep into government agencies. It is not so much the laws that count as it is the interpretation of those laws—as has been obvious in recent years. What, if anything, can or will be done is causing endless debate.

• *Metal Credit Corporation Will Be Proposed*

According to a recent report, Senator Ed Johnson of Colorado will introduce a bill into the 83rd Congress to set up a Metal Credit Corporation to operate along the same lines as the Commodity Credit Corporation, but authorized to deal entirely in domestic minerals and metals. Apparently the proposed federal corporation would be chartered to purchase when materials are plentiful and release material to industry when they are scarce or needed for war. The mechanism appears to be that of a buffer stockpile with price support features. To some extent such a corporation would be in competition for materials with the Munitions Board and the EPS branch of GSA, although the bulk of the purchasing EPS does for the national stockpile under Public Law 520 is done abroad.

• *Copper Price Meeting To Be Held*

After long urging the officials of the Office of Price Stabilization have agreed to hold a meeting with the Primary Copper Producers Advisory Committee to hear industry recommendations for decontrol of prices and for a uniform pricing system to replace the hodge podge of copper prices that now exists. However, no specific date for the meeting has yet been set.

The OPS estimates and predicts that decontrol would result in a U. S. market price for copper of about 31.5 cents per pound, compared to the present ceiling price of 24.5 cents. Meanwhile, on the other side of the Atlantic, Great Britain has had her copper supply curtailed by a strike of Rhodesian producers and will probably have to look elsewhere for any additional metal required, possibly to Chile, with a prospect of paying more than she likes.

• *Hits Western Mines*

The Economic Cooperation Administration's policy of subsidizing foreign mines has had wide-spread and damaging effect on western mines. As one prominent mining official puts it, "important sections of our country's domestic sources of lead and zinc face shut-down and permanent ruin. In the event of open hostilities we may find ourselves unable to import from abroad." He declares that our national interest demands that America maintain domestic sources of supply.

He pointed out that in the average American lead-zinc mine, labor costs represent more than half the total operating costs. "Our living standards in this country properly require a day's pay for miners in the neighborhood of $14. Compare such wages with those of our foreign competitors, many of whom have been helped by U. S. government subsidies," he says.

He also comments that "our policy of subsidizing foreign countries produces further problems." He explained that hundreds of millions of dollars have been spent to encourage foreign production of lead and zinc, at the same time affording such countries American dollars. Thus the American producers through taxes are being forced to help their competitors. This competition, he says, through low wages and American help, can flood the world market with lead and zinc below the prices we must maintain.

This is just one more of the many problems which will be laid on the doorstep of the new administration in Washington after January 20.

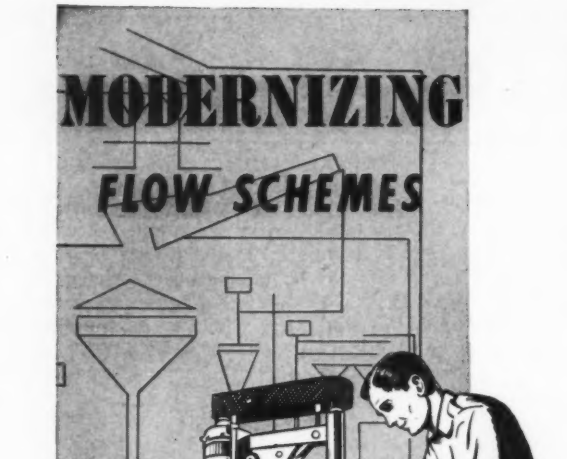
• *Senator Lodge Has Big Task*

Senator Lodge is checking into the affairs of all branches of the government excepting the Budget Bureau so that reports can be made to President-elect Eisenhower on the conduct of these agencies. His assignment is so vast there is little hope that the Senator will be able to give more than a passing glance to the minerals and metals field. Lodge has no special staff for this purpose, but will use the present facilities and staff of his senatorial office.

It is expected that the pricing policies of OPS and the allocation policies of NPA may come in for some scrutiny, and there may be a study made of the advisability of drawing the majority of the emergency defense agencies into one organization, such as the old WPB.

• *Defense Program Will Be The Key*

The drop in zinc requirements, furnished to DMPA by DPA and the Munitions Board, of something over a quarter of a million tons, makes the development of a new aggressive zinc program unlikely unless there is an



Metallurgy never has been—and never will be—a static science. Year after year, new reagents and processes and new combinations of older reagents and methods tend to obsolete many time-honored beneficiation practices.

A re-study of your ore-dressing methods at this time may reveal worthwhile opportunities for cutting costs, improving recovery, or both. Newer Cyanamid Reagents or new methods of using older Cyanamid Reagents have helped others and may help you. You may be able to use Heavy-Media Separation or the Dutch State Mines Cyclone Separator Processes to cut milling costs.

Cyanamid Field Engineers stand ready to work with you in modernizing your flow schemes. On request, we will be pleased to have the Cyanamid Field Engineer nearest to your mill call upon you.

AMERICAN
Cyanamid
COMPANY
MINERAL DRESSING DIVISION
30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK

upturn in demand which will tighten the market and sharply increase the market price. This change could come about if the new administration decides to accelerate the defense program which, in the past year, has been allowed to develop slow motion, particularly abroad.

• *Land Management Holds Record*

Mining applicants for government aid are frequently frustrated by the length of time it takes to get an application processed and accepted or rejected. The usual time is from six months to two years, probably averaging nearly a year. However, these people are in clover compared with those who apply for mineral patents to the Bureau of Land Management.

Two to five years is the ordinary lag in business there. Even to obtain a prospecting permit generally takes not less than a year and a half. The excuse is lack of clerical help and other personnel. It would not be surprising if an investigation of this Bureau did not show a backlog of more than 40,000 cases of various sorts, with some application dates running back more than five years.

It is high time that some congressional committee investigated this appalling situation and either shook the bureau out of its lethargy, if that is what's the trouble, or aided it in getting more help, if that complaint is true. This backlog of cases should be cleared and records brought up to date.

• *Canada Sets A Good Example*

The fight to maintain percentage depletion for the metal mining industry is never ending. Avid tax gatherers always have an eye out to see if they can chisel something off the 15 percent allowance. Contrast this situation with Canada, where profits of all base metal mines are exempt from Dominion taxation for three years and the depletion allowance is 33-1/3 percent! Is there any wonder that Canadian mining has expanded so rapidly in this favorable atmosphere? A bill to exempt new mines from taxes for five years, introduced by Representative Walter Baring of Nevada, not only was ignored by the government but, strangely enough, by the mining industry as well.

• *Gold Rumors Circulate*

A fairly persistent idea is going the rounds that the new administration will be more friendly toward an increase in the gold price. There is no doubt that the international pressures for such an action are increasing and it is possible that the congressional atmosphere may be more favorable to passing one of the "free" gold bills if the new Secretary of the Treasury does not oppose its passage as did Secretary Snyder. Do not expect, however, any immediate revaluation move.

COMING CONVENTIONS

January 13, 1953. Annual meeting MINING AND METALLURGICAL SOCIETY OF AMERICA, Mining Club, New York, New York.

January 16 through 19, 1953. Annual meeting, AIME, Statler Hotel, Los Angeles, California.

February 12, 13 and 14, 1953. Mining Conclave and Convention, COLORADO MINING ASSOCIATION, Shirley Savoy Hotel, Denver, Colorado.

March 31 through April 2, 1953. FIRST INTERNATIONAL MAGNESIUM EXPOSITION, Washington, D. C.

July 13 to 16, 1953. Fiftieth anniversary meeting IDAHO MINING ASSOCIATION, Sun Valley, Idaho.

—Drifts and Crosscuts—

CONVENTIONS: Once again the season for the annual mining conventions is at hand. The industry's pace-setting convention of the Colorado Mining Association is scheduled for Denver, Colorado, from February 12th through the 14th. The AIME has scheduled its annual meeting for Los Angeles, California, from the 16th to the 19th, immediately following the Colorado convention. Operators, government officials, and manufacturers from the east have extended their trips to go on to California from Colorado.

The conventions this year are of greater importance than ever before. A new national administration will be in office. Important changes in Congressional committees will have been made dealing with banking and currency, taxation, interior and insular affairs, the Atomic Energy Commission, and other vital subjects affecting every mining operation.

Nor can the old administration be forgotten. The meetings come at a time when its policies are being felt by a large segment of the mining industry—particularly the lead and zinc producers. Many operators have pointed out that the low prices for lead and zinc are inherent from the administration which lavished American taxpayer's dollars upon the foreign mines, removed entirely or drastically reduced tariffs, poorly timed stockpile buying, and established domestic metal ceilings below foreign import prices. Changing these policies will be a major order of business.

Attend the conventions. Hear the industry and government leaders discuss the problems and their solutions. Take part in the conventions. Contribute to the conventions. Give the mining world your plans and suggestions.

The conventions are not all work. See your friends again is almost reason enough for your attendance. Mining men form a unique and self-contained fraternity. They move around so often that they have friends and fellow workers everywhere. See your friends, renew acquaintances, see if Joe has struck it rich or if that cross cut has hit the vein.

These reasons—and many more are why mining men everywhere are saying, "see you at the conventions."

DOMESTIC DEVELOPMENTS—The Idarado Mining Company, already Colorado's largest gold, silver, and copper producer and second largest lead miner, has important plans for new developments in the San Juan Mountains. . . . ● Base metal miners in the northwest are doing an outstanding job in maintaining production despite serious power curtailments ordered by the federal government. . . . Development and exploration have been sacrificed for production which could have serious repercussions later. . . . ● It might be more than coincidence that a 15-man expedition is sailing from Long Beach, California to search for its third time for the buried treasure on Cocos Island described by John D. Mitchell in the October issue of *Mining World*.

NEW PROCESSES—International Minerals & Chemical Corporation's new dry electro separation process for potash and phosphate promises to revolutionize mineral dressing in the nonmetallic field. . . . A new super-scale pilot plant is under construction at Carlsbad, New Mexico. . . . Called the LeBaron-Lawver Process after its co-developers. . . . ● The first man-made uranium deposit will soon be built at Walker Air Field, Grand Junction, Colorado. . . . The United States Geological Survey will build it of concrete and known amounts of U_3O_8, then fly airplanes over it to calibrate their radiation detection instruments. . . . No similar installation is known to exist anywhere.

ACTIVITY ABROAD—Copper made the news as 1952 ended. . . . Cerro de Pasco Corporation started an extensive diamond and churn drilling program at its Cuajone porphry copper deposit in Peru. . . . ● In Africa the Konkola and Kirila Bomwe Special Grant Areas in Northern Rhodesia will be the scene of a new major mine. . . . It will be operated by a new company formed by Rhokana Corporation, Ltd. with an annual production of 40,000 tons of copper. . . . The mine is the Bancroft mine named after the pioneer geologist. . . . ● France and its colonies have never had an important copper mine. . . . This could change with the exploration of the Akjuojt deposit in Mauretania yielding impressive results. . . . See the place-fix map and article in the International News Section for complete data on the deposit. . . . ●The Israeli government has developed 40,000,000 tons of open-pit copper ore at Nahal Timna. . . . Production by the middle of 1953 will be in excess of 15,000 tons monthly.

METAL TRENDS—Antimony, lead, zinc, and gold are currently selling at prices below their actual development, plus recovery costs on a metal unit per unit replacement basis for many mines in the world. . . . ● Canadian gold miners received some good news when Canadian Finance Minister Abbott announced that maximum assistance will be raised to $13.50 per ounce from the existing $11.50. . . . ● The decision of the Swiss Federal Court that private minting of gold coins no longer in circulation as legal tender was not counterfeiting means that premium for coins over bars will disappear on the free market.

MINING IN THE NEXT FOUR YEARS

What the domestic miner can expect from the new administration and what he can do to get qualified men in key positions to fairly represent him

Prospecting along the Potomac, John Hardrock might well be humming the old hillbilly ballad, "If it ain't one thing, it's another." John was fed up worse than on sowbelly after a snow-in with the socialistic schemes of Ickes & Company and he heaved mightily to make a change in Washington. Things are changed but they're not all cured and in some respects Westerners are farther outside than before.

The new administration is predominately one of the northeast. The Secretary of State is from New York as are the new Attorney General and Deputy Attorney General. The Secretary of Commerce is from Boston, and the Secretary of Defense from Detroit, while the new Postmaster General is from nearby Flint, Michigan. The Secretary of the Treasury comes from Cleveland.

These predictions and forecasts can be made for the agencies, policies, and items most vital to the mining industry and the west in view of appointments and Washington trends.

DEPARTMENT OF THE INTERIOR—The west is fortunate in having a westerner—Douglas McKay, governor of Oregon as the Interior Secretary-designate. His state lies outside the controversies of the Colorado River Basin. He is not a mining man but has issued several important statements on mining in the past. His statement for the Colorado Mining Association's *1952 Mining Yearbook* in regard to mining follows:

"Mineral reserves were depleted in World War II and exploration and development of new reserves suffered. We, as a nation, are not in a position to meet the huge requirements for metals that would be forced upon us by all-out war. All organizations in mining states should cooperate in every way possible to build up a healthy mining industry so necessary to our security. Such cooperation among mining groups can accomplish very tangible results.

"All organizations in the mining states should be very much aware of the need for conservation in the mineral industry. This conservation, to my mind, includes long-range planning insofar as possible so that not only the most profitable ore in a deposit may be mined but plans should be considered for the future mining of the marginal ore unprofitable at present. In looking to the future, lower and lower grade ores must be made available to our industry because the higher grade material will gradually be worked out and we must not become dependent on foreign countries for our metal supplies.

"Under present conditions the prices of some of our nonferrous metals, including gold, are not realistic compared to domestic operating costs, and prices and wages paid in foreign markets. Thus domestic producers are in a bad competitive position and must leave unmined low-grade ores which may be forever lost unless consideration is given to plans for their future extraction. This matter of exploration and development of marginal ores will become more and more important as time goes on, and the matter should receive the earnest attention of everyone interested in maintaining a healthy domestic mining industry."

Worsening of metal prices since he made the statement focuses attention on the mining problems the new administration and the Interior Department in particular will face.

Douglas McKay
Secretary of the Interior-designate has a wide knowledge of the west.

UNITED STATES BUREAU OF MINES—The present director of the Bureau is due for retirement in about a year's time. One of the western mining associations has already come out for a new director. Reports are that an official of the DMEA in Washington and a Regional Director of the Bureau might be interested in the job if it were offered.

If the domestic mining industry wants a new director and thinks that the new Secretary of the Interior will change all Bureau heads it should be thinking about recommending a western mine operator who has had both coal and metal mining operational experience as well as having served in Washington as an industry representative advising the government on its minerals program. Experience in testifying before Congressional committees would be a valuable asset. Politically, such a man should come from a State with a senior Republican Senator.

UNITED STATES GEOLOGICAL SURVEY—The Survey has always been considered such a high level technical organization by the mining industry that politics has no place or right in its administration and operation.

DEFENSE MINERALS EXPLORATION ADMINISTRATION—The new Congress will determine the future status of this organization. Washington reports indicate that there may be difficulty in securing finances for a continuation of the exploration program. All programs now underway will of course be completed.

DEFENSE MATERIALS PROCUREMENT AGENCY—Both the administrator Jess Larson, and deputy administrator Howard I. Young, have been reported as desirous of returning to private life. Mr. Young in particular has been carrying a terrific load, devoting full time to the DMPA and directing the American Zinc, Lead and Smelting Company operations at night and over the week ends. Adverse publicity re-

ceived by DMPA in the Compania Atlantica and Silver-Miller Mines Limited cases must be overcome. Another problem which must be settled is that of determining what is to become of the metals now under contract which are scheduled for delivery well into the last half of the 1950 to 1960 period, in view of the fact that Larson has predicted an early end to DMPA. Congress should pass a law to clarify this situation.

UNITED STATES ATOMIC ENERGY COMMISSION—No change in policy or personnel is foreseen. Any change would be for an increased uranium mining and recovery program for nuclear fuel despite the announced success of "breeding" which in effect creates energy with lessening uranium requirements. The mining industry should be alert to any changes in the commission personnel and request that an engineer with uranium mining and milling experience be appointed to any future vacancy.

TAXATION—Percentage depletion seems safe, though attacks may be made on the rates allowed certain commodities. The excess profits tax seems doomed, amid the cheers of all. The President-elect has announced his opposition to the 25 percent limit on Federal income taxes, a measure which has been passed by some 20 State Legislatures and which would put an effective brake on runaway Washington Spending.

MONETARY POLICIES—The new administrators are reported to favor sound money and no doubt they do. As international business men, many of them know the futility of foreign printing-press money. But a number of the leading nominees have been associated with the $35.00 gold school. Insistence upon a return to a gold standard frozen on $35.00 per ounce, would merely drain the national reserves, encourage hoarding and inflation, and close the gold mines. The West has an intensive job of selling to do, to bring the sound-money advocates around to a realistic viewpoint of the value of gold in paper money and commodities. To re-establish gold at $35.00 would be as asinine as the currency rates set at Bretton Woods, which have plagued the free world ever since.

Secretary of the Treasury-to-be Humphrey will be the first Secretary in many years with first hand knowledge of mining. An important fact for the entire industry.

Western operators have concernedly pointed out the facts that a Democratic administration passed the Domestic Silver Purchase Act and that a man long associated with the eastern silver manufacturers is a cabinet member-designate. However, optimistically they also say that legislation will be required to change the law and that the domestic price may be holding down the world price in view of increasing production costs and lessening production.

George M. Humphrey
Secretary of the Treasury-designate knows the mining industry.

PUBLIC LANDS—Interior Secretary-to-be McKay is very definitely a private enterprise advocate who believes in the development of natural resources by private enterprise rather than by Government. He also believes that the Government should step in on the extremely large projects which cannot possibly be handled by private enterprise. Many small mine owners, however, know that he did not halt the attacks upon the mining laws in his state.

IMPORTANCE OF SUBCOMMITTEES—The new chairman of the Senate Interior and Insular Affairs Committee is scheduled to be Hugh Butler of Nebraska. Dean P. Taylor of New York will head the similar House committee. Neither comes from a mining state. Butler has been interested in mining and has competent advisors in the west. Nevertheless it is of the greatest importance that the mining subcommittees of these all-important major committees be headed by active mining-minded members of Congress.

TARIFFS—The Republican Party has long been the champion of tariffs for the protection of domestic industry. The 82nd Congress passed legislation to reestablish a tariff on lead and zinc. In effect it was a sliding scale tariff. Now the domestic mining industry has unified for a sliding scale equalization tax on United States imports of lead and zinc and undoubtedly the 83rd Congress will be asked to enact such a plan into law.

PROBLEMS IN MAKING CHANGES—A further cause of doubt that public land and mining policies will be greatly changed for the relief of the Western miner lies in the fact that the new Government can change relatively few administrative officials. Some estimates put the total number of positions to be filled by Republican appointment at from 2,000 to 8,000 Federal personnel, excluding the Armed Services, of some 2,300,000. It has been pointed out that the "middle bureaucrats," those just under the Assistant Secretaries, will largely carry over, entrenched in their Civil Service posts. These men, career officeholders, can kill policies they dislike by sheer delaying tactics, continual time-killing conferences, endless rewriting, supported by the mountainous regulations written in the 20 years of the New Deal. What is needed is to abolish the "slanted" regulations and get back to the law, where the law is sound, and to write new law where the statutes emanated from the influence of Ickes and Tugwell.

ACTION NEEDED NOW—The mining industry has a golden opportunity and patriotic duty to see that a western man who better knows the problems of the mining industry than any of the secretary appointees be picked as an Assistant Secretary of the Interior. His voice will be strongly heard in advising the Secretary regarding mining. Furthermore, the industry should select and support a western operator for the next Director of the Bureau of Mines.

Now is the time, while the assembling Administration is still in some degree flexible, for the mining industry to carry its case to the executive departments and Congressional Committees, seeking friends, stating its needs, planning its testimony. Nor should the task, long and tiring though it be, be left with a "let George do it" attitude to one mining group. Twenty voices are more impressive than one; a chorus convinces where a single voice is lost amid the heckling of the foes of domestic mining. The West's battle of the Potomac, never won, commences anew. With devoted spokesmen we may advance further than ever before.

DANGERS IN THE ANTIMONY SITUATION

Domestic mine production is negligible—
Domestic consumption remains high—
Foreign mine production is lessening—
Foreign production threatened—
Stockpile may be inadequate—

The world-wide antimony situation is extremely dangerous to the well-being and safety of the United States.

Domestic mine production of antimony in September was only 0.0021 percent of United States consumption. Contrast this with the January 1952 figures for production and consumption shown in the included table when production was 26.2 percent of consumption.

The reason for this is the mid-1952 closing of the Yellow Pine mine and smelter at Stibnite, Idaho. This one property with an annual capacity of 4,000 tons of antimony can supply about 20 percent of peacetime and 10 percent of wartime requirements for the United States. The mine was closed due to the heavy liquidation in the United States of foreign antimony inventories at depressed prices.

The mining industry, western Senators and Congressmen, and public-spirited civic groups have repeatedly advised the many Federal agencies, bureaus, and boards dealing with mining and mineral procurement of this alarming situation. Total result to date has been the reply that antimony is no longer considered to be a strategic metal and that the total requirements of the United States stockpile for antimony have been met.

Total United States consumption of antimony in 1952 varied little by little from month to month and in September was higher than in January.

Consumption of antimony in 1953 is expected to remain relatively high, while any increase in the requirements for antimony oxide used for flame-proofing textiles required by the military would immediately increase the rate of use.

Generally uncertain at best is any future outlook for mineral production. However, it is an actual fact—not a prediction—that there can be no resumption of mining or smelting at Yellow Pine until the summer of 1953 due to the physical impossibility of reopening the isolated mine under the existing severe winter weather conditions. If market conditions warrant, however, the Yellow Pine smelter may operate on accumulated in-process material (slag, dross, fume, etc.) during the last half of 1953.

What of Free World antimony mine production outside the United States in the same period? Accurate figures are more difficult to obtain, but it is known that the rate of mining is down, particularly in the Union of South Africa. Bolivian exports have changed only a little as the first 10 months of 1952 average rate was 890 short tons. High was 1,348 tons in May, with a low of 584 tons in September. The 1949 rate was 940 tons per month and 805 in 1950.

Production from the Union of South Africa can be varied over a wide degree by the rate of operations at the Murchison mine of the Consolidated Murchison (Transvaal) Goldfields and Development Company, Limited. From available data, it can be estimated that the company's expanded output in 1950 and 1951 was mainly due to high-grade ore. Production in 1951 was 17,480 short tons of antimony. The 1952 rate was about half as large.

In Mexico there has been a continuing downward trend in production due to the depletion of the higher grade ore deposits amenable to hand sorting.

Resumption of full-scale Bolivian mine production in the foreseeable future is doubtful in view of the activities of the government in seizing the tin mines. Antimony could well be the next mineral to be nationalized.

According to qualified estimates by key industry spokesmen, the national stockpile has about 20,000 tons of contained antimony. This is only the equivalent of a six-month supply of primary antimony at the World War II peak rate of consumption. It is believed that the stockpile contains antimonial lead, as well as a considerable tonnage of antimony in ore. In time of emergency, there would be a necessary time interval delay in converting the ore to antimony oxide suitable for flame proofing. The question is therefore one of adequacy as to both tonnage and type of material stockpiled.

In view of the conditions outlined above, and taking all factors into consideration, a shortage of antimony is likely. This will be caused by the time and difficulties in reactivating closed or curtailed mining operations, both here and abroad. It does not seem possible that sufficient Free World mine production can be reactivated in time to avert a critical shortage of primary antimony during 1953.

It is hoped that the Federal government will adopt a realistic program to encourage domestic antimony mining in view of the criticalness of the situation. The first step in such a program would be for the Munitions Board to raise its stockpile objective. A more realistic tariff would encourage domestic mining. Such a tariff should raise the rates above the existing 1.0¢ per pound on oxide, 2.0¢ per pound on metal, and establish a tariff on ore.

Overall Summary of the Primary Antimony Situation Using Latest U. S. Bureau of Mines Statistics for Short Tons of Contained Metal

Period	*U.S. Mine Production*	*Net U.S. Imports*[1]	*Total U.S. Consumption*[2]	*Total U.S. Industrial Stocks at End of Period*[3]
1951	3,512	15,563	17,519	8,373
(1951 mon. avg.)	(293)	(1,297)	(1,460)	——
Jan.	357	1,392	1,364[4]	9,048
Feb.	272	1,247	1,130[4]	9,536
March	153	1,182	1,251[4]	9,374
April	268	745	1,234[4]	8,879
May	357	828	1,020[4]	8,718
June	305	871	1,013[4]	8,079
July	159	784	926[4]	7,973
Aug.	42	1,014	1,309[4]	7,836
Sept.	3	918	1,399[4]	7,475

1. Ore, sulfide, metal, and oxide. 2. Metal and nonmetal products. 3. Includes total inventories of producers, smelters, consumers and dealers in following forms: ore and concentrate, metal, sulfide, oxide, residues and slags. 4. Monthly consumption data about 10 percent lower than actual (small consumers report annually and not monthly).

INTERNATIONAL PANORAMA

VANCOUVER, BRITISH COLUMBIA—Newmont Mining Corporation is advancing $800,000 to Pacific Nickel Mines, Ltd. for further development of its Choate nickel mine. Newmont geophysicists have been examining the property since May 1952.

HENDERSON, NEVADA—Titanium metal production is now four tons daily at the plant of the Titanium Metals Corporation of America—the world's first fully integrated ore to titanium metal plant.

DUNCAN, ARIZONA—The Arizona Eastern Fluorspar Corporation is building a 75 ton fluorspar flotation mill here.

WASHINGTON—The DPA has granted Olin Industries, Inc. a Certificate of Necessity and rapid acceleration for a planned $168,000,000 aluminum plant. Plant capacity is to be 110,000 tons of primary aluminum per year. This is the first announcement of a plant in the government's third round of aluminum expansion.

CIUDAD TRUJILLO, DOMINICAN REPUBLIC—The first shipment, 5,450 tons, of high grade magnetite iron ore from the Santo Domingo ore body has been shipped to the Chester Blast Furnace Company, Chester, Pennsylvania.

RIDDLE, OREGON—The Hanna Coal & Ore Corporation has received a rapid tax amortization certificate for nickel ore development and smelting for its low grade Nickel Mountain property here.

TORONTO—Falconbridge Nickel Mines, Ltd. has received a $5,000,000 credit from the Export-Import Bank to substantially increase nickel production. Development at the Falconbridge mine will be pushed and the New Hardy mine brought into production.

TRAIL, BRITISH COLUMBIA—Consolidated Mining & Smelting Company is curtailing zinc production about 25 percent due to shortage of hydroelectric power. The Trail plant is Canada's largest zinc refinery.

BELGRADE—Yugoslavia's steel production in 1952 was about 460,000 tons. Two new open hearths, one at Zenica and the other at Jesenice made possible an increase from the 434,000 produced in 1951.

MOBILE, ALABAMA—The first shipload of Jamaican bauxite from mines of the Reynolds Metals Company has reached the United States. The 13,000 ton cargo will be made into aluminum at Hurricane Creek, Arkansas.

BUTTE, MONTANA—The Defense Production Administration has established a production goal for battery and chemical grades of manganese for 1954. Goal is 110,000 long tons, at least two-thirds of which should be battery grades. 1950 supply was 87,000 long tons.

OSLO—Falconbridge Nikkelverk Aktieselskap is increasing the capacity of its electrolytic nickel plant at Kristainsand from 13,500 to 15,000 tons per year. The plant extension is to be completed in 18 months.

TOOELE, UTAH—International Smelting & Refining Company has closed its lead-zinc smelter here due to an ore shortage for an undeterminate period. Mine closures and low lead and zinc prices have cut down on the regular smelter ore and concentrate receipts.

WASHINGTON—The Defense Production Administration has raised its goal for annual nickel production to 190,000 short tons in 1955. This is an increase of 58,000 tons over the 1954 goal.

DARWIN, AUSTRALIA—Airborne radioactive surveys indicate a zone stretching more than 180 miles south of here to a point south of Katherine. At least 50 anomalies have been recorded in the area.

PARIS—End use controls for copper in 18 European countries have been abolished by the Organization for European Economic Cooperation because of the greater ease in purchasing non-European copper.

TEL AVIV, ISRAEL—The State of Israel has produced its first test ingot of locally mined and smelted copper. Production of 100,000 tons of copper ore is scheduled from the open pit mine at Nahal Timna.

BATTLE MOUNTAIN, NEVADA—The Copper Canyon Mining Company has closed its lead-zinc mine and mill because of low metal prices. The mine and mill plants will be kept in standby condition.

DEMERARA, BRITISH GUIANA—Reynolds Metals Company has purchased the mines, machinery, transportation equipment, and a stockpile of high grade bauxite ore from a subsidiary of the American Cyanamid Company. Reynolds plans to modernize the operations and expand bauxite production.

WASHINGTON—DMPA purchases of tungsten for the stockpile through October 31, 1952 were 64,467 short ton units.

KITWE, NORTHERN RHODESIA—A new copper mining company has been formed to develop the Bancroft mine on the Konkola and Kirila Bomwe special grant areas now owned by Rhokana Corporation, Ltd. Ore reserves are estimated at over 80,000,000 tons.

DURANGO, COLORADO—The Vanadium Corporation of America is making a second expansion at its uranium-vanadium processing plant here. The capacity is to be increased 30 percent.

DILLON, MONTANA—A tungsten flotation plant and chemical plant with a daily capacity of 400 to 500 tons is planned to treat Beaverhead County tungsten ores. The plant will be built and operated by mining companies in the area.

MOUNT MORGAN, QUEENSLAND—Mount Morgan Ltd. has announced plans to spend £2,000,000 for stripping the Sugarloaf copper-gold-pyrite ore bodies, for plant improvements, and to install equipment for maximum pyrite recovery.

Utah Construction Gets Contract for Korean Mines

The Utah Construction Company of San Francisco, California has negotiated a management-type contract with the Republic of Korea for the rehabilitation of Korean tungsten mines and mills and for an increase in tungsten production.

Actual work under the contract is scheduled to start this month and will be prosecuted in three phases. The first is to examine and determine the physical status of Korean properties and milling facilities; the second is to evaluate the findings and determine a program; the third is to accomplish the program. Key personnel and necessary equipment will be sent to Korea from the United States.

Korean tungsten is now being purchased by the Defense Materials Procurement Agency, as will the future production at an increased output rate.

Cerro de Pasco Begins Cuajone Drilling Program

Cerro de Pasco Corporation, after a small-scale program of drilling and prospect drifting, coupled with a geophysical survey, is starting an extended program of diamond and churn drilling at its Cuajone porphyry copper deposit in Peru.

The property adjoins the Toquepala deposit of the Northern Peru Mining Company, a subsidiary of American Smelting and Refining Company. It is located 50 kms. northeast of Moquegua in the southern part of the country at an elevation of about 10,000 feet.

New Tax Write-offs Given Olin by DPA for Aluminum

Two certificates of necessity for fast tax write-offs have been granted Olin Industries, Inc., by the Defense Production Administration. Both apply to the $168,000,000 aluminum facilities planned by Olin. The first certificate applies to 85 percent of the $123,000,000 required for primary aluminum production facilities; the second allows write-off on 50 percent of $45,000,000, the cost of a sheet, plate, and extrusion plant.

Though final location of the plant has not yet been published, Olin has announced plans to begin construction as soon as possible. Olin Industries will be the fifth United States company in the primary aluminum field. Their plant when completed is scheduled to produce 110,000 tons of aluminum annually.

According to Samuel W. Anderson, deputy administrator for aluminum, this action by DPA leaves 90,000 of the 200,000 tons of expansion eligible for certificates of necessity, a figure set by a recent government goal for additional aluminum expansion.

Kennecott Copper Corporation's Ray Mines Division is now producing 13,000 tons of copper ore per day from its new pit at Ray, Arizona. An additional 2,000 tons is daily hoisted at the main shaft from the underground mine adjacent to the pit. Underground ore is dumped in a headframe bin in the main crusher plant; pit ore is fed to a primary crusher at the left of the pictured area.

COPPER'S NEWEST BIG OPEN PIT

Production from Kennecott's newly developed Ray Pit, Ray, Arizona places it among the front ranks of the world's great surface mines.

Another major open-pit mine has been added to the list of important producers of short-supply copper. Kennecott Copper Corporation's new Ray pit at Ray, Arizona is now in production at a daily rate of 13,000 tons after a long history of exploration, design, and development. This increase has made the Ray district the seventh largest producer of primary copper in the United States.

Original underground workings, abandoned because of excessive water, extended from the existing Ray underground mine and were driven in but a small section of the deposit. Post-War drilling and exploration proved the low-grade area amenable to surface mining on a large scale. To handle the ore from this surface operation as well as the adjacent underground properties, a new crushing plant was designed and built by Kennecott.

A. P. Morris is general manager of the Ray Mines Division of Kennecott Copper Corporation.

Exploration and Geology

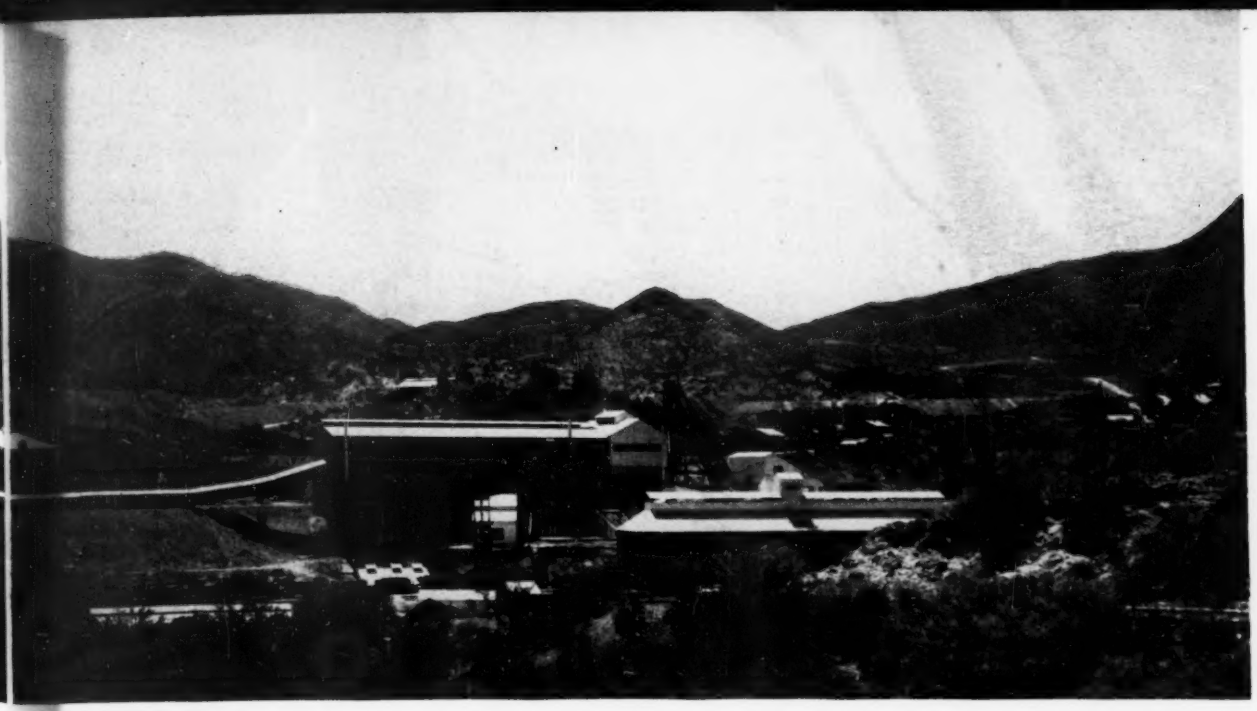
The area was first drilled between 1909 and 1912. Churn drill holes were spaced at 200-foot centers over the orebody. Since that time, information gained from diamond drill holes has supplemented the original data by defining ore boundaries. At the present time, diamond drilling is carried on both by the company and by contractors to further delineate the deposit.

Present Ray ore production comes largely from the secondary enrichment of chalcocite in the Pre-Cambrian Pinal schists. The only primary ore mined occurs as disseminated chalcopyrite in a diabase sill, seemingly a better host for primary sulphides than the surrounding acidic rocks. This sill, now showing a dip of about 15° to the east, acted as a dam to the descending enriched solutions and little or no ore has been found below it. Intensive fault movement has left, above the sill, a 15-foot layer of gouge containing concentrations of the secondary chalcocite.

Primary copper minerals are thought to originate from a stock of quartz monzonite porphyry forming Granite Mountain. From this stock, southwest of the orebody, fractures radiated through the presently mineralized area furnishing the channels for subsequent mineralization. However, the disseminated primary chalcopyrite, locally known as protore, has not been found in acidic rock in mineable grade.

In the vicinity of the gouge blanket, sulfides have been altered in places to specimen-grade native copper and cuprite. Surface carbonates and silicates were shipped during World War I by lessees and presently find value as a fluxing agent.

Most of the ore appears in small quartz veinlets associated with pyritization in a sericitic schist gangue. Gold, silver, and molybdenum are minor constituents and of little commercial importance. Ore grade averages about one percent copper in schist and about 0.5 percent in the primary diabase.



Shortly after World War II, it was decided to develop the low-grade mineralized areas adjacent to the operating underground mine for open-pit operation. Copper Canyon ran through this area and the water it carried had prevented economical underground mining. Isbell Construction Company of Reno, Nevada was awarded the stripping contract and began moving equipment to the property in January 1948. Design and engineering were handled by the Kennecott staff.

Open-Pit Development

First, Copper Canyon was diverted to a neighboring valley, a project that required about six months. By April 1948, stripping had begun in the pit area and subsequently reached a rate of 40,000 tons per day. Isbell used a Northwest Diesel shovel carrying a 2½-yard bucket for the preliminary work, later substituting 5-yard 120-B's and a 3-yard 54-B, all Bucyrus-Erie units. Stripped material was dumped in an area about a mile south of the pit.

Though end-dump trucks have commonly been standard in stripping and mining by truck haulage, it was thought that 25-yard, bottom-dump, tractor-trailer units common to heavy construction would prove feasible at the Ray pit because of their mechanical simplicity, low maintenance costs, and adaptability to either on-the-move or stationary dumping. The highly specialized units, however, proved to have two important drawbacks. Coarsely broken rock was found to be difficult to dump through the trailers, and steep grades lessened traction on the driving wheels. Where material free from large pieces was hauled over nearly level grades, the tractor-trailers proved superior to end-dump trucks in the same service.

Production

Ore was first uncovered and mined in 1949 while stripping was still in progress. Ray's primary crushing facilities were inadequate to handle the coarse pit ore and increased production. To supplement the existing plant, a temporary installation was built. Ore was dumped and pushed by bulldozer to an 8K Gates crusher. Crushed material was conveyed into the existing plant of the underground mine where it was mixed with the underground product in two gyratory crushers. Shortly before the completion of the stripping contracts, ore production was taken over by Kennecott.

A Diesel and two electric 29-T Bucyrus Erie churn drills carrying 9-inch bits are used for blast hole drilling. Records up to the present show that about 100 feet of hole are drilled per drill shift. Bits are sharpened after 110 feet of use

Copper Canyon, shown here where it enters the present pit area, carried a water course that had prevented underground work in the area. The diversion of this course was the first step undertaken by the Isbell Construction Company in stripping and preparing the pit for production.

The wide, clean benches at the Ray pit, designed to give maximum production with minimum maintenance to rolling stock, are kept that way with bulldozers and blades cleaning around shovels and along haul surfaces.

and lose about ⅜ of an inch per sharpening.

Benches average 40 feet in height and are drilled with 45-foot vertical holes placed on 18-foot centers in a line about 15 feet from the edge of the berm. These distances are only approximate and vary with the nature of the ore.

Holes are loaded with 70 percent powder, loose in dry ground and in cartridges where water is encountered. Millisecond delay electric blasting is used for detonation.

In places where necessary, toe holes are drilled with Gardner-Denver wagon drills and loaded with Amogel #1, 60 percent stick powder. For bulldozing large boulders, Amogel #5, 30 percent, is loaded in holes drilled by jackhammers. To supply the air required by secondary blasting, the company has two Gardner-Denver compressors—a 210-cubic-foot Diesel and a 500-cubic-foot electric. Total powder consumption is about ⅜ pound per yard of material or about 6 tons of ore per pound of powder.

Two Marion 4161 electric shovels carrying 5½-yard Amsco dippers with replaceable Clark teeth, one 6-yard P&H 1600 and one 2½-yard P&H 955, are used for loading fifteen 35-ton Euclid end-dump dual rear axle trucks. These trucks have hydraulic steering and are powered by Allison torque converters with two 200-hp. Cummins Diesel engines, each driving a separate set of rear wheels.

The large shovels load on an average of 6,000 tons per shovel shift with a maximum of nearly 10,500 tons. Two are used on the day, afternoon and graveyard shifts to allow stripping to continue at a proposed rate of about 20,000 tons per day.

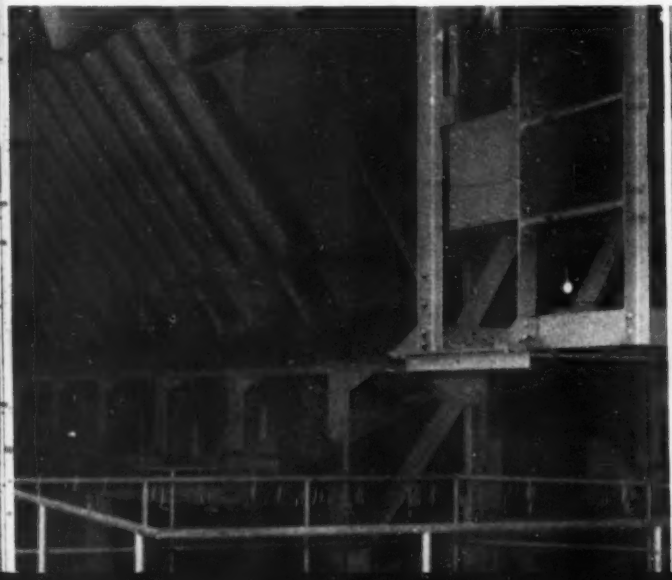
Crusher Construction

The concentrator that handles Ray ore is at Hayden, Arizona, about 22 miles from the mine site, requiring rail haulage. To simplify rail car loading, the ore is crushed at the mine. Because the old plant that handled underground production was hardly adequate to process the expanded output, an entirely new installation was designed and built by Kennecott. This plant, now finished, undoubtedly ranks as one of the finest and most modern of its kind.

Trucks from the pit dump their 35-ton loads through a sliding-door hatch above the bin that feeds the huge primary crusher in the Ray crushing plant. Underground ore is handled separately by a second primary crusher at the opposite end of the plant.

Trucks from the pit dump their loads through sliding, horizontal doors at the head of the plant. A sloping 20 by 40-foot grizzly of 75-pound rails spaced at 8 inches separates the falling ore into two fractions. Coarse material is crushed in an 84 by 60-inch Allis-Chalmers jaw crusher driven by a 300-hp. motor. Both the crushed fraction and the fines are passed by Stephens-Adamson pan feeders to a 48-inch belt conveyor 398 feet long that lifts the ore at a slope of 15°. A Dings magnet separates tramp iron at the high end of the belt where the ore drops to a second 48-inch conveyor. As the material travels over this

LEFT: Both underground and pit ore are combined in a 300-ton temporary storage bin in the main crushing building. Ten rotary feeders mounted beneath the bin pass the crushed ore to screens and rolls in closed circuit with the bin for further reduction before rail shipment to Kennecott's Hayden mill. RIGHT: A Merrick Weightometer records the exact tonnage of pit ore passing along the horizontal second belt in Ray's newly constructed crushing plant.



The aerial view of Kennecott Copper Corporation's Ray pit shown above is a montage reproduced from aerial photographs taken by Phillip K. Laylander, consulting geologist, as a part of his research on geologic applications of color aerial photography. The prominent benches of the Ray pit can be seen at the center (north is at the bottom in this view, the scale is roughly 1 inch equals 600 feet.) The primary crushing plant is just to the left of the point where the peripheral roads join below the pit. From the primary crusher, a 522-foot conveyor leads (down and to the right) to the secondary crushing plant. The main headframe of the underground mine is at the lower end of the secondary plant. Surface subsidence in the lower right has been caused by the underground block caving that formerly accounted for Ray's total production. The light section at top right forms the dumping area for the disposal of waste from the pit. Kennecott's railroad leads from the crushing plants south (upward) to the company mill at Hayden, Arizona.

Churn drills carrying 9-inch bits sink 100 feet of 45-foot blast holes per shift at Kennecott's Ray pit. Holes are generally spaced on 18-foot centers in a line 15 feet from the crest of the bank, placement varying with the nature of the material drilled.

level, 522-foot belt, tonnages are checked against truck factors by a Merrick model E Weightometer. A Dings Alnico guard magnet is installed under the belt to signal the presence of tramp iron not removed by the first magnet.

At the inclined discharge end of the second belt, the ore stream is split and fed to two 5 by 8-foot Robbins Gyrex screens. Oversize, plus-two-inches, is crushed by two Symons standard 7-foot cone crushers. The fines and crushed product are conveyed by a pair of 42-inch belts to a 300 ton surge bin.

Skip-hoisted underground ore is dumped into a 300-ton bin on the 105-foot headframe over the main shaft. Here it splits and travels by two high-frequency, Utah-type vibrating feeders and grizzlies to two Symons gyratory crushers. Undersize from the grizzlies and crushed oversize are belt-conveyed to the surge bin that receives the crushed pit ore.

Ten rotary feeders under the surge bin feed the ore to eight Symons Rod Deck screens and two Allis-Chalmers Ripl-Flo screens. The oversize from the screens is conveyed by a pair of 42-inch belts to two Garfield 72 by 20-inch rolls and is returned to the surge bin for rescreening. After temporary storage, the ore is loaded into 60-ton railroad cars for transfer to Kennecott's Hayden mill.

Outstanding Crusher Features

At least three features of the new plant make it outstanding. First, the general excellence of the design and construction of the buildings and equipment give it maximum capacity and efficiency. Second, the elaborate dust control system that has been installed throughout the plant reduces maintenance repairs to expensive motors and equipment and practically eliminates cleanup expenses. Third, the extensive use of Corrulux corrugated, translucent, plastic panels for exterior sheeting, replacing windows, permits good diffused natural lighting without the heat normally admitted through glass.

In conjunction with the enlarged operation of the Ray Mines Division, both water and power were required in increased quantities. Kennecott's staff designed and built a dam for this purpose in Little Box Canyon two miles north of the Ray pit. The unique design includes a 30-foot, concrete, gravity-type plug poured on the excavated bedrock in a narrow, steep-walled section of the canyon. Surmounting the plug is a thin-section, variable-radius, arch dam. Water removal from the 540-acre-foot reservoir is provided by a series of tunnels, beneath the reservoir, that lead from a shaft sunk near its edge. Water enters the tunnels through churn drill holes lined with split casing and plugged at the surface with concrete to prevent collar caving and the entrance of surface debris. Two centrifugal pumps lift the water from the shaft to a concrete reservoir for distribution.

Electric power for the pit and crusher is generated by a steam-turbine plant at Hayden. Transmission lines are tied to the power system of Arizona's Salt River Water Users Association. Because the Hayden plant generates 60-cycle current as opposed to the 25-cycle current used by the Association, a frequency changer has been installed to convert one to the other, thus enabling power to pass from the lightly loaded to the heavily loaded circuit.

LEFT: Shovels with 5½-yard dippers load 34-ton end-dump trucks at the rate of 6,000 tons per shift. Two shovels are used on each of the three shifts, moving roughly 33,000 tons of material per day—13,000 tons of ore and 20,000 tons of stripping. RIGHT: Kennecott's staff designed and built this dam in Little Box Canyon two miles north of the Ray pit to supply the increased needs of Ray's expansion.

Albert K. Smith, Jr., resident engineer for Idaho Beryllium & Mica Corporation, holds sheets of mica and crystals of beryl from the firm's Latah County mine.

Photographs by Robert H. Forbes.

Overburden is removed from the pegmatite with a Caterpillar-drawn scraper. Hard rock is wagon drilled and blasted.

STRATEGIC MICA FROM IDAHO

The Idaho Beryllium & Mica Corporation is producing high quality sheet mica and beryl from its Latah County mine for United States stockpile

Operations have now resumed after a seven-year shutdown at the largest muscovite mica mine in the western United States and one of the largest in the country. Owned by Idaho Beryllium & Mica Corporation, the mine is located in the mountains of northern Idaho, 10 miles northwest of Deary in Latah County, where mining is done by open pitting.

During World War II (from October 1943 to May 1945), this mine, with a history of on-and-off activity since 1888, produced 85,660 pounds of sheet mica and other mica products for the war effort. National defense needs now have the mine again concentrating upon the production of sheet mica.

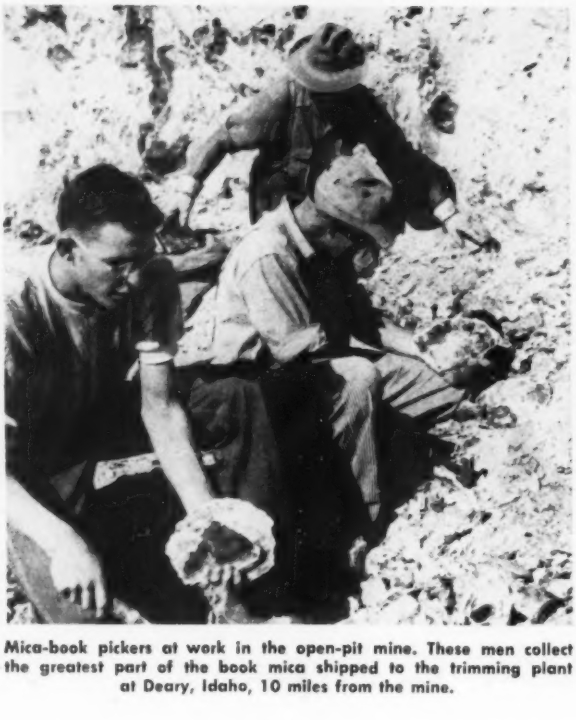
Through the cooperation of the Reconstruction Finance Corporation, part of an RFC production loan of $125,000 granted in April 1952 for the production of beryl and ground mica has been utilized to start the production of strategic sheet mica which will be shipped to the mica buying depot of the General Services Administration at Custer, South Dakota. The accompanying table indicates the sizes and grades of mica shipped from the mine, up to September 26, 1952. Mica is produced in many different grades, but the three grades acceptable for federal government purchase requirements are good stained and better, stained, and heavy stained.

Open-Pit Mining

Several vein-like deposits of mica-quartz-feldspar pegmatite exist at the corporation's mine. In the open pit, systematic drilling and blasting loosen mica-bearing mineral for a crew of men, who pick by hand and store in sacks large aggregates (books) of sheet mica and also punch mica. The last is mica which will work up into thin wafers having an area of less than one square inch of usable mica. Punch mica, now being stockpiled, is used for radio-tube supports and many other products requiring only a small, but clear, usable area.

A bulldozer then pushes the remaining minerals to an area of the

A section of the well-lighted cutting room at Deary. Normally about 50 women are employed here as cutters and trimmers.



Mica-book pickers at work in the open-pit mine. These men collect the greatest part of the book mica shipped to the trimming plant at Deary, Idaho, 10 miles from the mine.

This young mica cutter at the Deary trimming plant displays several books of mica from the stockpile. The mica is not black as it appears in this photograph, but is ruby- or rum-colored.

mine reached by a drag line which carries mica, feldspar, and other minerals to a screening plant. Thus, all sheet mica blasted loose and 90 percent of the punch mica is being recovered.

Three Caterpillar tractors and operators working two eight-hour shifts per day, and two of these working an additional eight-hour shift at night, are needed to handle all mining and road building. Tractors are two D-8s and a D-6. Men on drilling and picking crews work only two shifts. This makes a total of 18 men on the job, 12 of whom stay at a modern camp 100 yards down the mountain side from the mine.

Superintendent Arley Haener is directing a joint company Defense Minerals Exploration Administration underground exploration program during the winter months. Diamond drilling has been completed preparatory to this step. Several shafts at the mine, sunk as early as in the 1890's, need only additional timbers and cleaning out for this work to start.

Screen And Hand Pick

The 100-yard-long drag line and Bagley scraper, operating by a double-drum electric hoist in the top level of the screening plant, pull pegmatite over a grizzly of railroad rails which retains all rocks larger than five inches in diameter. The large material is then stockpiled for later crushing and additional recovery, while fines under five inches drop to a belt feeder and from there to a 4 by 8-foot Cedar Rapids shaker screen with one-inch mesh. Small material (earth, quartz, feldspar, schist from the inclosing country rock, and fine mica) then travels to a dump pile on a conveyor belt.

All minerals between one inch and five inches in size travel over a separate belt where a hand-picker is stationed. After mica is picked off, waste is dumped onto the main waste belt. This separation of large and small material is made for ease in picking.

Beryl, which is found with the mica, is now being hand-picked and stockpiled for future shipment. The Beryl assays 10 to 14 percent beryllium oxide.

Work at night is possible because of electric lighting from an REA power line completed after several months of construction through the thick forest between the mine and Deary. Electric power is also used for the 75-hp. Westinghouse electric motor which drives the Ingersoll-Rand compressor, for the 50-hp. motor of the screening plant, for an arc welder, and for conveniences at the mine camp. Eventually, electric

The three-bench, open-pit mica mine has been developed on the steep mountain slope at right angles to the pegmatite's strike.

Dimensions of Sheet Mica Produced by Idaho Beryllium & Mica Corporation

Size Number	*Specifications*
3	Minimum of 10 square inches in useable rectangle
4	Minimum of 6 square inches and maximum of 10 square inches
5	Minimum of 3 square inches and maximum of 6 square inches
5½	Minimum of 1½ square inches and maximum of 3 square inches
6	Minimum of 1 square inch and maximum of 1½ square inches

power will also be needed for grinding machinery which is to be installed.

Trimming Plant At Deary

A reserve of 70 tons of hand-cobbled mica (with extraneous minerals and earth merely knocked off by hand) has been built up at the Deary trimming plant of the corporation where 2,000-pound quantities of the transparent mineral are prepared for shipment. Preparation is accomplished by a crew of from 50 to 60 women working with sheets of mica at benches. The majority of benches in the warehouse-like plant have a light box, a chart of mica sizes, and a vertically set, one-inch wooden board at each stall where a woman is stationed. Women cut sheets of mica into their largest clear area by means of a linoleum knife run along the side of the vertical board.

Block to Cut: 20 to 1

This cutting results in quantities of waste product for which a grinding machine will be installed to grind it as fine as flour. Approximately 2,000 pounds of block mica must be brought from the mine for every 100 pounds of cut mica shipped, according to resident engineer Albert K. Smith, Jr. Flour mica is used in paints, the tire industry, plastics, wallpaper, and for finishing buildings.

Six of the women's benches are occupied by "rifters" who split mica books into thinner sections. These women produce "films," "thins," and "sheets" of 8/10,000 to 40/10,000-inch thickness, under 7/1,000-inch thickness, and under ⅛-inch thickness, respectively.

The other small particles of mica produced at the mine, containing sand and other foreign matter, are called "roofing" mica, and are used in the manufacture of asphalt shingles to prevent their sticking together.

Workmen completing the 10-mile-long, high-voltage power line to the mine through the rugged tree-covered mountains of northern Idaho.

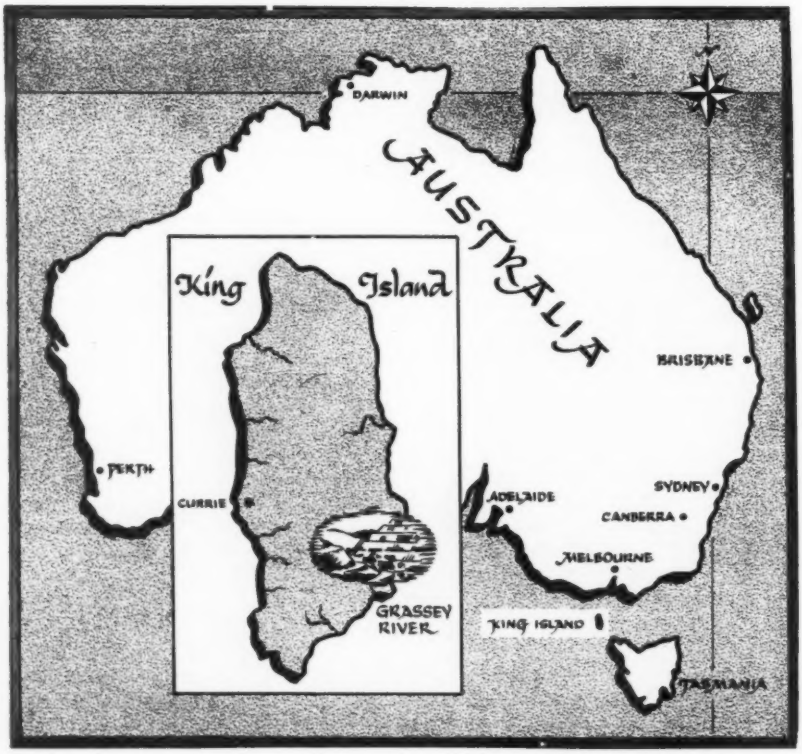
Orville Slette, manager of the firm's office in the Deary plant, estimates that the present sheet mica output will continue for at least three years; then other mica products will add an indefinite number of years to the life of the operation.

The drag line pulls the broken pegmatite from the open-pit mine high on Moscow Mountain to the grizzly and screening plant.

King Island Scheelite's modern gravity-flotation mill is built on the seacoast of King Island south of Australia.

TUNGSTEN FROM "DOWN UNDER"

On King Island just south of Australia the world's largest known scheelite ore body is mined to fulfill United States and British purchase contracts



Production of scheelite ore from the world's largest known scheelite orebody has been increased under terms of a contract made between King Island Scheelite (1947) Ltd. and the governments of the United States and the United Kingdom.

The orebody is located on Tiny King Island in Bass Strait between the Australian city of Melbourne and the Island of Tasmania. At the end of 1950, drilled reserves totalled 2,629,000 tons, averaging 0.64 percent WO_3.

Under the contract, expansion of open pit mining and a 50 percent increase in mill capacity have been completed. A diamond drilling program has also been outlined to determine drilling and to further delineate the football of the orebody. Maximum production is assured over a period of seven years during the length of the contract with the United States. A separate five-year contract has been signed with the United Kingdom.

Geology-Mineralogy

Scheelite occurs in two garnetiferous beds in the contact metamor-

phic zone of a granite mass forming a hillside close to the sea. The country rocks include numerous types of hornfels; aplite dikes are present and granite occurs to the south. The scheelite occurs in garnet-hornfels, garnet-pyroxene-hornfels and, to a less extent, in pyroxene-garnet-hornfels. The mineralized zone has a length of at least 1,400 feet and a total thickness of 150 to 222 feet where not reduced by faulting. It has a general strike of 100° and a dip of 50° to the south, but the eastern part strikes at 45° and dips southeast at 40°. Faulting has an important bearing on the distribution of the ore, and horizontal displacements up to 90 feet have been noted. The orebody is cut off by a fault on the eastern end about 450 feet inland from the southwestern coast of the island. The limits to the west and at depth have not been fully determined.

A typical section through the mineralized zone from top to bottom may be generalized as follows:

Thickness	*Rock Type*
Up to 55 feet	Pyroxene-garnet-hornfels Hanging wall
3 to 37 feet (Top orebody)	Garnet hornfels, averages 1.37 percent WO_3.
4 to 26 feet	Barren band (Marker)
50 to 110 feet (Bottom orebody)	Garnet-pyroxene-hornfels with low-grade ore bands. Averages about 0.55 percent WO_3.
2 to 25 feet	Garnet-pyroxene-hornfels with increasing amounts of actinolite-hornfels. Transition section. Footwall

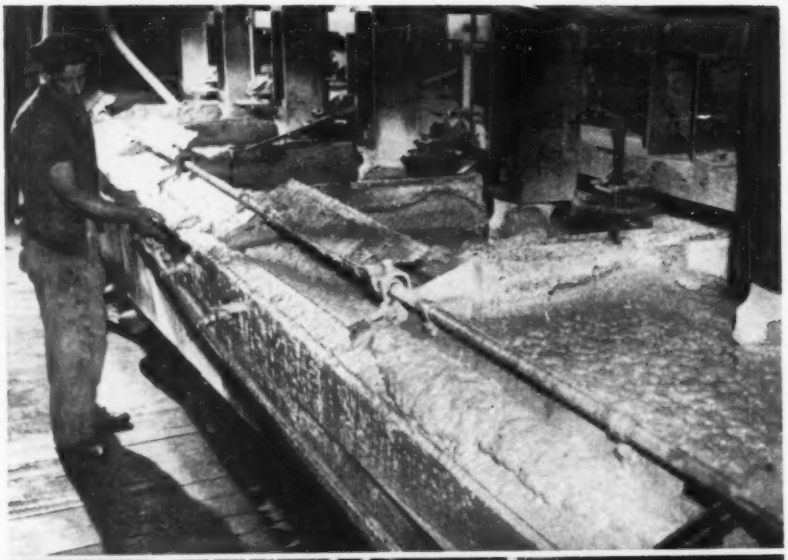
Intense folding of the garnetiferous beds is shown in this section of the pit where the higher grade top ore body is being mined.

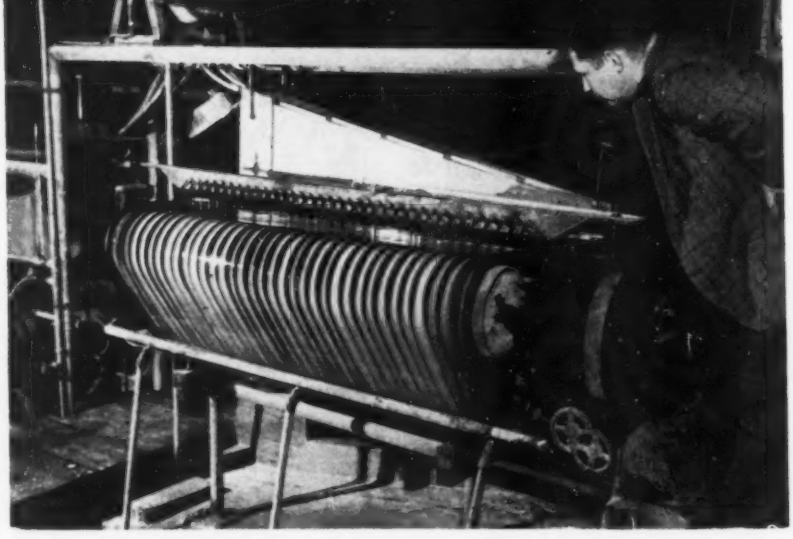
Age of these rocks is unknown. The economic mineral (scheelite) occurs both as disseminated grains and in veins, mostly the former; generally, grain size is less than 0.2 mm. Molybdenite is present and is separated from the concentrate after shipment to the United States. (Concentrate carries up to 2.0 percent Mo as molybdenite and calcium molybdate).

Truck Pit Mining

Mining is by open pitting, with hillside benches at 30, 50, 70, 90, 110, and 150 feet above sea level. Vertical blast holes are drilled by wagon

A series of 20-foot-high benches have been established in the open pit. Diesel shovels load White and Euclid trucks.





drills. Toe holes are rarely necessary.

Overburden of sand, clay, and rock is removed mainly in summer due to adverse weather conditions at other times (latitude 40°S. high rainfall; cold westerly winds in winter). Sand and clay are carried to dumps by truck or by Le Tourneau Carry-all scraper of 12-cubic-yard capacity hauled by a Caterpillar DB Diesel tractor. Suitable rock is used for road building.

Five contract men form a drilling and blasting crew. Drilling is by two wagon-mounted drifter-type drills with 2¼-inch detachable bits. Holes are sprung, loaded with A.N. 50 or 60 percent gelignite powder and electrically fired.

The pit floor is cleaned by bulldozer. Broken rock is loaded into White 8-ton dump trucks. Some of the oldest trucks have given eight years' service and are being replaced.

TOP: Scheelite is recovered from the minus-200-mesh slime in this eight cell Denver "Sub A" flotation machine. CENTER: These Wilfley tables are used to make a high-grade scheelite concentrate. BOTTOM: This Isbell vanner was specially built by the company to upgrade the low-grade scheelite flotation concentrate.

Ore is carried to the mill (¾-mile round trip) and waste to dumps (0.9-mile round trip).

Tonnages handled for a typical year are: ore to mill, 160,553 tons (0.59 percent WO_3); waste rock to dumps or roads, 11,639 tons; other overburden dumped, 142,626 tons.

Two new 2½-cubic-yard shovels, four Euclid dump trucks, and a third Caterpillar bulldozer have recently been placed in operation to expand ore production. Increased mining has also necessitated an increase in the rate of stripping; during the last year, the waste-to-ore ratio has risen to two-to-one, compared with the one-to-one ratio outlined above.

Gravity-Flotation Mill

The mill originally had a designed capacity of 5,000 tons of ore per week operating 168 hours. After the contract was signed between the company and the United Kingdom and United States governments for increased tungsten, the mill capacity was increased 50 percent by adding an additional ball mill and 18 tables. Expansion has been slowed by the shortage of supplies, labor, and ship transportation. It has often been necessary to use costly air freight for shipments.

An aerial view of King Island Scheelite, beside the blue water of Bass Strait, showing the mill in the upper left corner and the open pit mine at lower right.

Ore is crushed to 8 inches in a 42x48-inch Hadfield jaw crusher, then passed to a concrete storage bin 22 feet square and 44 feet deep. Ore is reduced in two further stages to minus-1-inch, ground to minus-100-mesh, and then separated into sand and slime in a turret bowl classifier set to overflow at minus-200-mesh.

Sand is fed to Fahrenwald sizers and then to Wilfley tables. Concentrate from the tables passes to redressing tables. Final tailing is rejected.

Cleaned concentrate is dried, roasted to eliminate sulphur in a 12-foot tube about 12 inches in diameter slowly revolving in an oil-fired combustion chamber held at 650°C. Tubes were formerly of cast iron but had variable life; an experimental stainless steel tube is giving very good service. This has a daily capacity of 3 tons of concentrate, carrying 12 percent sulphur (mostly as pyrite).

Following roasting is magnetic separation after which the high-grade concentrate (67 percent WO_3) is bagged and weighed ready for shipment.

Fine Scheelite Floated

Minus-200-mesh slime from the classifier is thickened and given flotation treatment in an eight-cell Denver "Sub-A" flotation machine. Sulphides are first removed, then scheelite floated, using a mixture of oleic acid, reagent 708, and Aerosol.

It was necessary to accept a low grade of flotation concentrate in order to achieve a satisfactory recovery. Despite several recleanings, concentrate assayed only about 20 percent WO_3, the balance being mainly calcite. Although there is a wide margin in specific gravity between calcite and scheelite, tables did not produce an acceptable recovery of scheelite if grade was raised to 50 percent WO_3.

Vanners were introduced in February 1950 after a long experimental run and performed with high efficiency. R. Fieldhouse, a tailing plant operator from Cornwall, England, was largely responsible for their introduction. Vanner concentrate assays about 50 percent WO_3.

Beginning in 1948, low-grade flotation concentrate was discharged to a storage dam pending future retreatment and, in August 1950, plans were made for a separate vanner section to concentrate the accumulation of scheelite. No vanners were available for purchase in Australia or overseas and the Company decided to design and build its own.

Water Supply

During the dry season, March to May, the mill has on occasions run out of water and forced to close. At other times, the flotation plant has not been able to operate because of the scarcity of clean fresh water. To alleviate this shortage a 45,000,000-gallon water storage reservoir was built in nearby Grass River in 1950. Two additional dams have since been built to furnish water for the enlarged mill. Electric power is generated by the company's Diesel-electric plant.

Loading blocky ore on one of the lower benches. It is trucked one-half mile to the crushing plant.

LEFT: View of the new Delcommune power dam looking downstream in late 1951. This is the third hydroelectric development of the Union Miniére du Haut-Katanga. The first two 40,000 h.p. units are scheduled for operation this year. RIGHT: As there is no suitable sand or gravel available near Zilo for concrete aggregate this quartz rock quarry was developed to supply aggregate.

This crushing and screening plant prepares aggregate from the quartz rock. Note the overhead carrier which transports the concrete from the mixing plant on the bank to the forms in the dam.

Upstream coffer dam and diversion tunnel for the rushing water of the Lualaba River.

MORE POWER FOR CONGO MINES

Union Miniere du Haut-Katanga's copper and cobalt output will be increased with Delcommune power

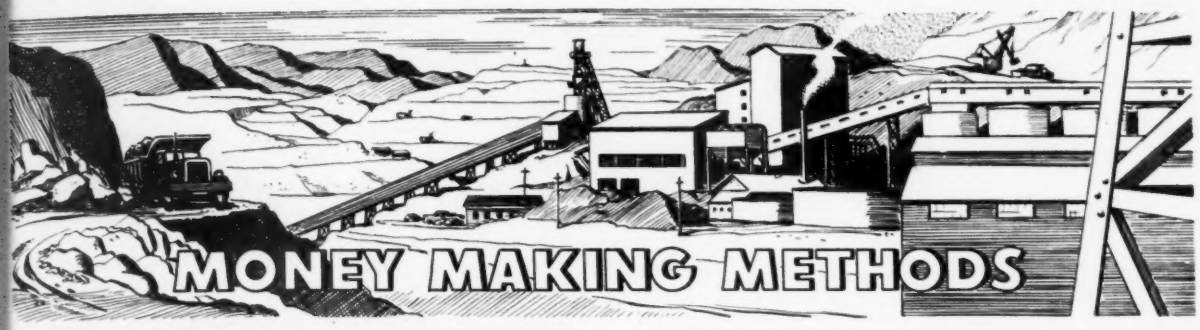
The mining and metallurgical industries of the Belgian Congo are dependent on electric power. From the electric locomotives in the great L'Ouest open pit mine to the electric furnaces at the Panda works which reduce electrolytic cobalt (93 to 94 percent Co) to 99 percent-pure granulated cobalt, electricity is the key item.

The Union Minière du Haut-Katanga is now building a new hydroelectric power plant and has a second planned. Together, they will increase electric output for powering the new ore washing plant at the Ruashi mine, for the enlargement of the Kolwezi flotation mill, for the new electrolytic cobalt furnace at Panda, and for the additional copper refining furnace at Shituru.

Pictures on this page, taken in late 1951 by Leo Lyons, show progress at the new Delcommune (Zilo) hydroelectric plant on the Lualaba River (Upper Congo) which is scheduled for completion in 1953. It will generate 500,000,000 kilowatts per year. The projected plant, to be built downstream from Delcommune, will be named Commandant Le Marinel and will generate 1,000,000,000 kilowatts per year starting in 1957.

The two operating hydroelectric plants at Franqui and Bia now have a combined generating capacity of only 534,000,000 kilowatts per year.

Electricity will be available to permit expansion of mining and metallurgical operations in 1953 and it is expected that mining activity will keep pace with increased power supplies for the next five years.



NEW STOPING MACHINE DOES THREE JOBS AT THE GRANDVIEW

Many new applications of underground trackless mining methods and equipment have been initiated in the Metaline Falls, Washington, lead-zinc district. Probably the most unique of these is the self-loading transport —jocularly dubbed the "Gismo" by miners—that was invented by Dale I. Hayes, the western manager for American Zinc, Lead and Smelting Company.

The new machine is a real triple-threat star. It combines in one machine the operations of drilling, loading, and hauling, and was designed expressly for stoping in thick, relatively flat orebodies. Its cost-cutting ability is clearly brought out by the records established during the 10-month test period it has been operated in American Zinc's Grandview mine near Metaline Falls. At present the self-loader is accounting for 80 percent—648 tons per day—of total mine production. Each of the two daily shifts consists of three drillers and one loader operator. In other words, a production rate of 81 tons per man shift in the stope is now maintained against the pre-Gismo rate of 14 tons on the same basis.

Basically the machine is a front-end loader and haul box mounted on crawler treads coupled ahead of a conventional, 40-hp., track-laying tractor. In mucking, the loader bucket moves with an upward and backward motion to dump its load in the 4½-ton transport box. By tractor power, the machine moves to a central dumping point (at the Grandview, a raise leading to the haulage level) and unloads through a bottom drop door.

Since little headroom is required to operate the bucket and because the mechanical functions of the machine are simple, it could be adapted easily to conventional mines for mucking in drifts and crosscuts, according to its inventor. Its design makes no limitations on the size or capacity of future models.

American Zinc's new mechanical miner, used underground at the Grandview mine in Washington, is a single-machine device for drilling, mucking, and hauling. Motive power is furnished by a crawler tractor.

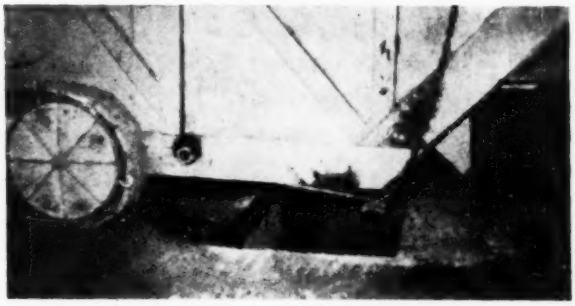
When mucking is completed, the Gismo is converted to a drilling jumbo by mounting three drifters on the front end. To facilitate this conversion, a 160-pound crane is carried on top of the machine. Two men can make the complete change-over in only 20 minutes. When drilling, the men work on demountable platforms assembled at the same time the drills are attached.

The machine has been patented by Hayes and was built at the Union Iron Works in Spokane, Washington. Only two have been assembled and the second was but recently completed and put into use at the Grandview.

Where grades are too steep for the crawler tractor, a standard slusher hoist has been successfully used for motive and operating power.

An excellent color movie of the Gismo created wide interest among mining men when it was shown at the Northwest Mining Association convention in Spokane in December.

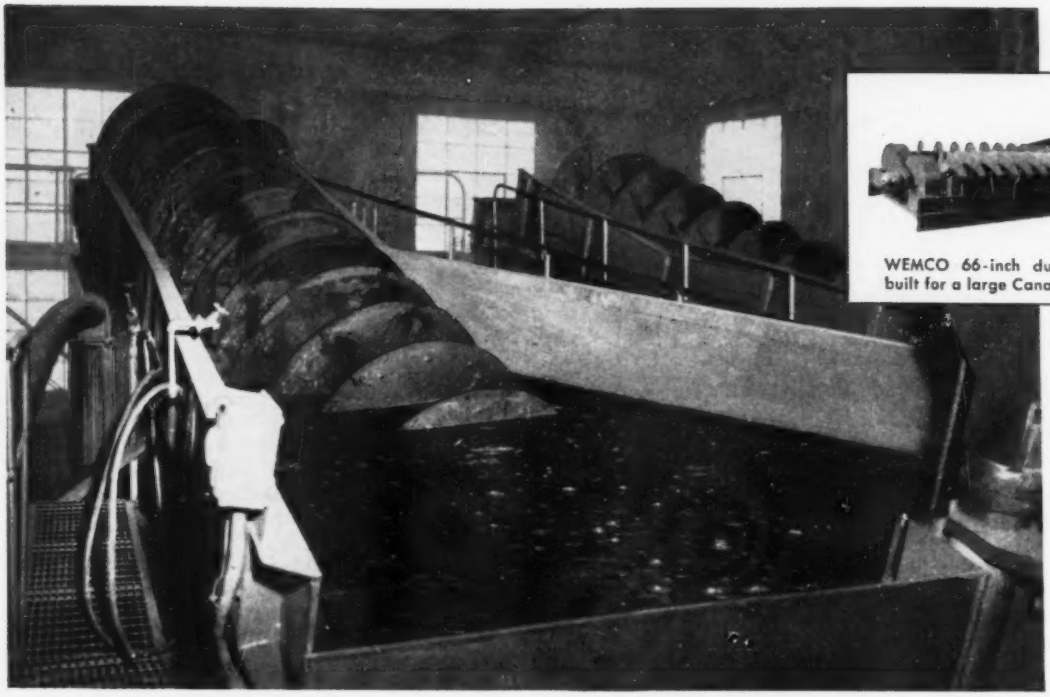
The 4½-yard haul box on the "Gismo," as miners call it, dumps its load through a bottom drop door.



HOW TO PUMP ACID MINE WATER

The Ballard zinc-lead mine of the St. Louis smelting and Refining Division of the National Lead Company has solved the problem of pumping acid mine water. The water in the mine, two miles west of Baxter Springs, Kansas has a pH between 3.2 and 3.5; ordinary pumps and pipe columns were quickly turned into sieves while pumping the water.

To combat corrosion, the mine now uses zinc-less, bronze-lined pumps with a stainless steel shaft. Rubber-lined intake pipe is used. The acidity of the water is also lowered by the addition of lime. A special mix house has been constructed on surface where 25 100-pound sacks of lime are pulped with water every eight hours to form a slurry. The slurry is gravity-fed directly into the underground pump sump through a pipe paralleling the mine water discharge column.



WEMCO 66-inch duplex classifier built for a large Canadian operator.

Two 60-inch, series 150 WEMCO S-H Classifiers in the regrind circuit of a large lead-zinc concentrator.

for better Classifier performance

in terms of

- *Less Oversize in Overflow*
- *Less Undersize in Sands*
- *Lower Operating Costs*
- *Longer Continuous Operation*
- *Greater Capacities*

—use ***WEMCO*** *S-H Classifiers*

These Exclusive Mechanical Features *of WEMCO S-H Classifiers are among the important reasons why* ***only*** *the WEMCO unit gives you these better performance factors — with the result that more and more operators throughout the world are choosing WEMCO for their classification jobs.*

1. **40% greater shaft strength,** for protection against shutdowns, is provided by WEMCO's large diameter tubular shafting.
2. **Longer-life wearing shoes** of tough, thick alloy and large cross-section, short cast steel flight arms. Shoe replacement costs have been reported as low as 4/100 of 1 cent per ton.
3. **Foolproof, efficient bearing units** are of the anti-friction type. Lower unit is grit-proof; upper unit is gudgeon type mounted on hub of bevel gear, designed for extra long life.
4. **Simple, hydraulic lifting device** gives uniform action and complete protection from clogging or jamming.
5. **Smooth, efficient drive** uses standard speed motors and a new type cone-gear reducer for maximum efficiency of power transmission.

Consult with WEMCO today on your classification problems. Competent engineering of your inquiry will be handled promptly and places you under no obligation.

WEMCO
WESTERN MACHINERY COMPANY
760-766 FOLSOM STREET · SAN FRANCISCO 7, CALIFORNIA

Mobil-Mills • Coal Spirals • HMS Thickeners • HMS Pumps • Sand Pumps • Cone Separators • Drum Separators • Fagergren Laboratory Units • Agitators • Fagergren & Steffensen Flotation Machines • Hydroseparators • S-H Classifiers • HMS Laboratory Units • Dewatering Spirals • Thickeners • Conditioners • Densifiers • Attrition Machines

PRINCIPAL OFFICES

San Francisco • Sacramento • Salt Lake City • Spokane • Pocatello, Idaho • Denver Phoenix • Chicago • Hibbing, Minnesota • New York • Toronto, Canada

EXPORT DISTRIBUTORS

- The Ore & Chemical Corporation, *80 Broad Street, New York 4, N.Y.*
- Fraser & Chalmers (S.A.) Ltd., *P.O. Box 619, Johannesburg, South Africa*
- Lilestone & Co., Inc., *P.O. Box 3368, Manila, Philippines*
- United Development Corporation Pty. Ltd., *P.O. Box 3460, Sydney, N.S.W., Australia*
- Corporation Commercial Sudamericana S.A., *Casilla 505, Lima, Peru*

Mining leaders of the Northwest were the key speakers at the Northwest Mining Association's 58th Annual Meeting. From left to right are Chester H. Steele, vice president in charge of western operations of the Anaconda Copper Mining Company, Butte, Montana, who addressed the joint Association-Columbia Section AIME luncheon meeting on *Butte Today;* Henry L. Day, president and general manager, Day Mines, Inc., Wallace, Idaho, spoke on the organization of Day Mines' staff; Harold J. Hull of Wallace was chairman of the resolutions committee; Wayne Gould, mill superintendent of the Sunshine Mining Company, Kellogg, Idaho, described *Milling Practices at the Sunshine Mine;* and Harry F. Magnuson, Wallace accountant who was the featured speaker on mine taxation.

Record Northwest Convention Features Butte Today, Zinc Tomorrow, and Mining's Future

"Bigger and better" has long been the slogan of each successive convention of the Northwest Mining Association. The 58th annual convention held in Spokane, Washington, on December 5 and 6, 1952 was no exception. Registration exceeded 600 with delegates attending from all parts of the United States, British Columbia, the Yukon, and Alaska.

The Columbia Section of the AIME and the Spokane Chamber of Commerce Mining Bureau cooperated with the Association in arranging the program and securing speakers. At the technical section sponsored by the AIME, chairman Joseph C. Kieffer of the Federal Mining and Smelting Company, Wallace, Idaho, emphasized the importance of the young engineers in the growth of the Coeur d'Alenes. In line with this thought, the committee had selected young engineers to carry out the technical program of the meeting.

Zinc Mining Outlook

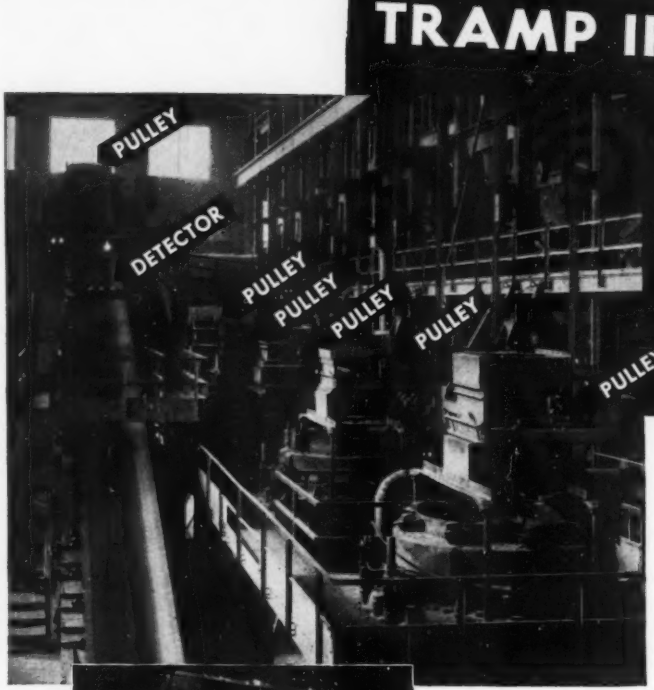
Russel B. Caples, manager of the Great Falls, Montana reduction plant of the Anaconda Copper Mining Company and president of the American Zinc Institute, read a paper of great interest to miners everywhere entitled "Current Outlook For Zinc Mining." He said that studies leave little doubt as to the availability of adequate zinc ore reserves so the great concern is that of the price for zinc. Price reduction in zinc, plus similar drops in lead and cadmium prices, have forced the closing down of mines and curtailment at others with the result that domestic production had been curtailed one-sixth, or 10,000 tons during September.

For the future, he said that,

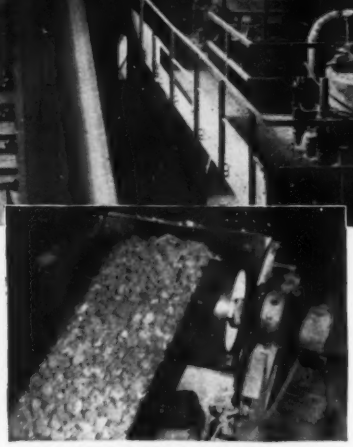
Robert J. Towne, Spokane mining equipment executive and general arrangements chairman of the convention (Left), shakes hands in welcoming Felix Edgar Wormser, vice president of the St. Joseph Lead Company, New York, New York, to the convention. Newly elected president of the Association Frank N. Marr, president of the Spokane Idaho Mining Company of Spokane, and P. Evan Oscarson, one of the Association's new vice presidents and a consulting geologist, are shown between Towne and Wormser.

Three of the nation's leading geologists discuss the geological section of the program in which they all participated. From left to right are Samuel G. Lasky, Paul Billingsley, and A. E. Weissenborn. Lasky represents the Secretary of the Interior on the Munitions Board interdepartmental committee on stockpiling. Billingsley is the internationally noted consulting geologist. Weissenborn heads the United States Geological Survey office in Spokane.

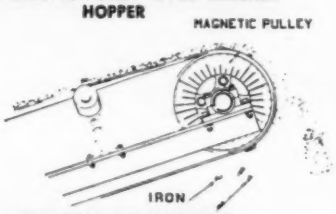
TRAMP IRON can't beat the Brains Brawn of this DINGS Iron Detector Magnetic Pulley Team



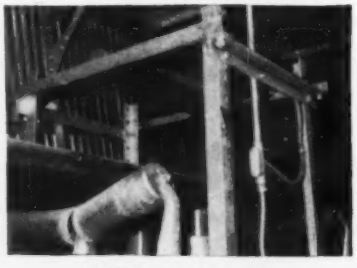
In this ore preparation plant—Quick acting Dings electronic Iron Detector checks main belt burden for large, unwieldy iron rods, rails, chunks—stops belt instantly for their removal. Then Dings Magnetic Pulleys take over the crusher protection job.



DINGS ELECTRO-PULLEY OVER CRUSHER HOPPER



PRINCIPLE OF MAGNETIC PULLEY OPERATION



DINGS IRON DETECTOR

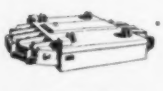
POWERFUL DINGS ELECTRO-PULLEYS . . . give fully automatic iron removal—have virtually unlimited life when given minimum attention. These units have the extra depth of magnetic field, required for heavier belt burdens—but cost very little to operate.

Installation as head pulleys in conveyor systems is usually simple—the Dings pulley shaft is machined to the dimensions of that of the pulley being replaced and the same bearings are used. Little wiring is required.

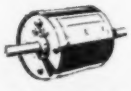
Dings air-cooled design provides cooler, more economical operation and longer life. Separate section construction plus bronze coil covers make possible the most efficient distribution, greatest penetration of magnetic field. And Dings coil winding process virtually eliminates the possibility of electrical breakdown. Get capacities and dimensions in Catalog C-1001-A.

Alone or in combination Dings Magnets are your best protection against tramp iron—for a look at the complete Dings line send for Catalog C-5000-B.

DINGS MAGNETIC SEPARATOR CO.
4719 W. Electric Ave., Milwaukee 46, Wis.



DINGS RM RECTANGUAR SUSPENDED MAGNETS



DINGS MAGNETIC PULLEYS—ELECTRIC AND NON-ELECTRIC PERMANENT

DINGS NON-ELECTRIC PERMA-DRUMS

DINGS MAGNETS

"while the short-term outlook is rather favorable, the long-term outlook is not as favorable for domestic zinc mining." He added that import duties must be at least maintained, if not raised, if the domestic industry is to remain strong. He hoped that the new administration would "be more appreciative of the problems, and that a long-range program for prospecting and development of our natural resources will soon be formulated . . . put into effect and carried through . . . to the end."

The Future of Mining

The opening speech and the one which drew the greatest interest from the attendees, probably because of its controversial nature, was by Samuel G. Lasky, representative of the Secretary of the Interior on the interdepartmental committee for stockpiling. Most certainly the controversy does not exist as to the future of mining but as to whose future it will be. Lasky saw a worldwide tide of increasing governmental interest in mineral resources. He said that this "stems from the essential responsibilities of government regarding welfare and security." His warning to the miners that unless the government had better information on industries ore reserves industry would be faced with mandatory reporting fell upon an unresponsive audience—one not in agreement with the thought.

Sliding Scale Equalization Tax

Felix Edgar Wormser, vice president of the St. Joseph Lead Company, New York, New York, reported that the lead and zinc miners were in a "pretty predicament through no fault of our own" due to both foreign and domestic governmental controls of mining and the metal market. As a means of maintaining a healthy, vigorous, and prosperous domestic metal mining industry, he advocated a "sliding scale equalization tax." It would keep the mining industry stimulated to high continuous productivity, be nondiscriminatory in application, not necessitate new bureaucracy, be automatic in operation, and allow imports as industry needed, he said.

Canadian Viewpoint on Gold

Howard T. James, managing director of Pioneer Gold Mines, Ltd., one of Canada's most important gold mining companies with operations in British Columbia, outlined a Canadian's point of view concerning gold. He outlined the history of gold in Canada, and the Emergency Gold Mining Assistance Act. He then said "the only way the industry can be saved is by an increase in the price for gold or a large depreciation in the price of the dollar—which latter is quite improbable." He outlined a program which of necessity must include United States cooperation to insure its success as follows: all restrictions on the movement and sale of gold should be removed, and Canada should mint gold not stamped as to value but as to weight. This would establish the value of gold, he added. In the final analysis, he said, gold was essential to trade and a sound and stable currency was essential for free-flowing trade again.

Butte Today

Chester H. Steele, vice president in charge of western operations of the Anaconda Copper Mining Company, reported that the future of zinc and manganese mining in the "Richest Hill on Earth" was greater than any earlier estimate. Plans had been made for block caving of zinc ore in the Rainbow vein over widths to 100 feet. As for the Greater Butte Project, he said that copper reserves were continually being increased and that 10,000 tons of ore per day

Recommendations of Policy Adopted by 58th Annual Convention Of The Northwest Mining Association

We, the members of the Northwest Mining Association, again pledge to our country the fullest use of our productive capacity to the end that we may deliver the maximum possible amounts of the metals and minerals needed for national defense and essential civilian use. To accomplish this, we ask that the government agencies use their powers and authorities to prevent the development of conditions which would curtail or interrupt production of the mining industry; that the manpower of the mines and metallurgical plants be conserved and augmented; that mining supplies and equipment be readily available; that safeguards be provided against sabotage; and that work stoppages be prevented wherever possible by the prompt application of existing laws.

GOVERNMENT EXPENDITURES: The reorganization and streamlining of government administration, the application of proven business practices, and the elimination of waste, extravagance, and duplication can make substantial reductions in government expenditure without curtailing essential functions of the government or crippling defense and emergency programs.

TAXATION: We recommend: the removal of the excess profits tax and the limitations on deductibility of exploration expenses; depletion allowances should be extended to stockholders; losses of loss years should be computed on the same basis as taxable income and deductions for percentage depletion and credits for dividends should not be denied either in the year of loss or in the year against which the loss is applicable; tax exemptions should be granted a new mine for three years after beginning of profitable operations; depreciation should be more fairly allowed, with full application of the tax benefit rule; more moderate tax rates upon capital gains; and a reduction in overall tax rate on both individual and corporation.

MANPOWER AND LABOR RELATIONS: We urge the amendment of the Labor-Management Relations Act to prohibit compulsory unionism in any form; prohibit labor monopolies and industry-wide bargaining; require the president, in threatened national emergency strike or lockout situations, to use the provisions of the Act; safeguard from union encroachment the functions of management and the rights of workers; restore stability to labor agreements; and create a department of Employer-Employee Relations in lieu of the Department of Labor.

GOLD, SILVER, AND MONETARY POLICY: We urge that the gold standard be restored at the earliest practicable time. Also that the restrictions on purchase, sale, and ownership of gold by American citizens be removed; and that Congress fix the ratio at which the dollar and gold are to be made fully convertible. We endorse the existing federal policy on silver; however, we believe the seigniorage now charged by the U.S. Treasury for newly mined silver should be removed.

STOCKPILING: We favor stockpiles on a permanent basis but we believe it should be done only when output exceeds demand. We also recommend that withdrawals be permitted only when there is a declared emergency.

PALEY REPORT: We commend the Commission for its compilation of much useful information, for its recommendations for tax revision and encouragement to small mining enterprises, and for increased topographical and geological mapping. However, we oppose the multilateral contract, international buffer stocks, and particularly combined with limited quota arrangements, and the land policy set forth.

TARIFF: We urge careful consideration of an equalizing or variable import tax on lead and zinc in inverse ratio to the price of these metals.

MINE FINANCING: We urge Congress to examine the practice of developing foreign mines at the expense of the American taxpayer and to the detriment of the domestic mining industry. Development of mineral resources by private capital is the American Way, and unnecessary handicaps and restrictions should be removed.

ANTIMONY: We recommend that proper governmental authorities review the antimony situation, and that domestic mining and smelting of antimony be encouraged.

PUBLIC LANDS: Certain alleged abuses in the mining law should be corrected but no changes in the basic law are recommended.

POWER SHORTAGE: We urge the Defense Electric Power Administration and any other authorized groups to exclude underground mining base power loads for pumping, ventilation, and service hoisting, from curtailment orders because these loads are fixed and have no relation to production.

CUMMINS DIESELS **are engineered to make light work of tough jobs**

Progressive, eyes-ahead engineering is one of the big reasons why so many mine and quarry operators pick Cummins Diesels for dependability.

Consider Cummins' exclusive system of fuel injection and metering—an important factor in the unequalled performance records established by lightweight, high-speed (60-600 h. p.) Cummins Diesels. No other Diesel fuel system is so simple...so rugged! It delivers a uniform, properly prepared fuel charge to every cylinder. All under low pressure—no chance of bursting and leaking fuel lines.

Your Cummins dealer will be glad to tell you more about the exclusive fuel system and other engineering advantages built into every Cummins Diesel. He is an expert who knows the requirements of your job. He heads up a specialized parts and service organization—equipped to handle all your diesel power needs. Call him today... or write!

CUMMINS

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana
Export: Cummins Diesel Export Corporation, Columbus, Indiana, U.S.A. • Cable: CUMDIEX

Leaders in rugged, lightweight, high-speed diesel power!

BOISE: Cummins Diesel Sales of Idaho, Inc.

LOS ANGELES: Cummins Service & Sales
Branch: BAKERSFIELD. *Authorized Sales & Service:* BLYTHE, Leo's Diesel Service; COLTON, Smith's Diesel Sales; EL CENTRO, Rhyne's Automotive Service; SAN LUIS OBISPO, San Luis Truck Service; SAN DIEGO, F. R. Laux Diesel Service; SANTA MARIA, Hanson Equipment Co.; BAKER, Newton Automotive Service.

PHOENIX: Cummins & Moran
Branch: ALBUQUERQUE. *Authorized Sales & Service:* YUMA, Cooper Tractor Service; LAS VEGAS, Stirling Diesel Service; EL PASO, Cummins & Moran of El Paso.

PORTLAND: Cummins Diesel Sales of Oregon, Inc.
Branches: EUGENE; PENDLETON; BAKER; COQUILLE; GRANTS PASS.

SALT LAKE CITY: Cummins Intermountain Diesel Sales Co.
Authorized Sales & Service: CEDAR CITY, Wally's Chevron Truck Service; IDAHO FALLS, Automotive Body and Machine, Inc.; ROCK SPRINGS, Jim Macy's Blue Bell Truckatorium; ST. GEORGE, Renouf & Thompson.

SAN FRANCISCO: Watson & Meehan
Branch: FRESNO. *Authorized Sales & Service:* STOCKTON, Connell Motor Truck Co.; SACRAMENTO, Frank J. Coyle; EUREKA, Fred E. Barnett Co.; RENO, Nevada Transit Co.

SEATTLE: Cummins Diesel Sales of Washington, Inc.
Authorized Sales & Service: ABERDEEN, Kenny's Cummins Diesel Service.

SPOKANE: Cummins Diesel Sales, Inc.
Authorized Sales & Service: MISSOULA, Taber's Truck Stop. (9-22-52)

The annual Sourdough Breakfast always brings out the old timers. Two of those honored were Frank Woodside at far left and Joseph Moris at far right. Woodside is manager of the British Columbia and Yukon Chamber of Mines and has been mining in the northwest for 56 years. Moris started mining 69 years ago and was a pioneer in the Coeur d'Alenes and Rossland, British Columbia. John Peacock, Kellogg, was toastmaster, and Robert B. Austin, Wallace, was Sourdough chairman.

were scheduled to be mined by January 1, 1953.

Milling Practices

Papers given at the convention included two outstanding reports on milling practice. One, a general resume of activities in British Columbia, was given by Harold M. Wright, president of Wright Engineers, Ltd., Vancouver, British Columbia. The other concerned procedures current at the Sunshine Mine in Idaho and was presented by Wayne D. Gould, mill superintendent of the Sunshine Mining Company.

Wright's report on British Columbia briefly summarized the history of milling growth in the metal mining industry since the early 1890's when concentration began in the Province.

Present procedures at the Sunshine mill, as reported by Wayne Gould, produces a single bulk float concentrate of copper, lead and silver from galena-tetrahedrite ore carried in a siderite-quartz gangue.

Gould outlined the flowsheet as follows: two stage crushing with the second stage in closed circuit with a screen, single stage grinding in closed circuit, and a bulk float of all the sulphide minerals (including minor amounts of pyrite, arsenopyrite, sphalerite).

Sub Level Stoping

Of the mining papers presented, a report on "Sub-Level Open Stoping with Long Holes at Reeves MacDonald Mines, Ltd." by L. M. Kinney, general superintendent of Reeves MacDonald, and a review of "Mechanized Mining at the Grandview Mine" by John W. Currie, mine superintendent for American Zinc, Lead, and Smelting Company, drew considerable interest.

As outlined by Kinney, the system involves scram levels (two have been established to date) separated by a series of sub levels at 50-foot vertical intervals. Stoping starts at the end of the slot away from the shaft by slashing a 10-foot-wide bench around the top of a connecting slot raise. Down holes widen the bench until foot and hanging wall are reached. Stoping then continues toward the shaft by benching 10-foot widths of the orebody and slicing these with long-holes (55 to 60 feet long since they follow the dip), toward the slot. Probably the most novel innovation Kinney reported, is the use of an International TD14 bulldozer on one level instead of a slusher to move the rock to ore passes.

Grandview's Mechanized Mining

John Currie described the development at American Zinc's Grandview mine of a completely integrated underground mining machine that performs the operations of drilling, mucking and transporting. Currie's talk was preceded by a color movie of the machine in operation.

The device consists of a bottom-dump transport, mounted on crawlers and carrying three long-shell drill jumbos, which loads itself with a low-clearance overhead bucket. The machine is coupled ahead of an Allis-Chalmers HD 5 G Diesel-powered tractor.

Officers for 1953

Frank N. Marr was elected president of the Association; P. C. Fedderson and P. Evan Oscarson, vice presidents; and E. K. Barnes, treasurer, by the trustees during the convention. Marr is an international mining man and is an officer and director of mines in Canada, the United States, and Mexico. As president of the Spokane-Idaho Mining Company with mines in the Coeur d'Alenes, he has long been interested in the development of northwest mining. Fedderson is lead smelter superintendent of Bunker Hill and Sullivan Mining and Concentrating Company, Kellogg, Idaho; Oscarson is a consulting geologist, while Barnes is a Spokane business man.

Compton I. White (Right) secretary-treasurer of the Whitedeff Mining and Development Company of Clark Fork, Idaho, shows a piece of the mine ore to Felix Edgar Wormser, Frank N. Marr, Robert J. Towne, and George L. McMahon at far left. McMahon, president of Pacific Petroleums, Ltd., Vancouver, British Columbia, described oil and gas developments in Canada at the meeting.

Columbia-Geneva STEEL AT WORK IN THE WEST—The San Francisco Bay Bridge, longest in the world

74% OF THIS STEEL came from Columbia-Geneva!

Of the 201,000 tons of steel that went into the San Francisco Bay Bridge, 149,000 tons—or 74%—came from Columbia-Geneva Steel.

This included steel of all types—structural steel, reinforcing steel, and steel wire for cables.

Big problems . . . small problems—You may not have a "Bay Bridge" to build, or ever need the quantity or many types of steel that it required. But when you think of steel for any job, big or small, think of Columbia-Geneva. It is the West's largest steel producer and is a member of the industrial family that serves the nation—United States Steel.

West's Largest Steel Producer **COLUMBIA-GENEVA STEEL**

Division United States Steel Corporation

USS

UNITED STATES STEEL

NEW SLUSHERS ARE TANDEMS

Recent slusher design incorporates tandem drums chain-driven from the rear for minimum space requirements and maximum repair ease.

Underground mines using a block caving method of extraction have been switching to the use of slusher drifts for positive control of the draw. The small slusher hoists available, however, did not produce the tonnages necessary for profitable operation of these properties, nor did standard slusher design lend itself to merely increasing the size and power of the hoists.

Wherever large standard slusher hoists have been used, serious drawbacks have become apparent. One of the most important, and often one of considerable expense, is the additional ground breakage required for the return-rope drum on the standard hoist that carries drums mounted on a common shaft. This breakage is necessary to put the center line of the pull drum as closely as possible to the center line of the drift for minimum fleet angle. Of course, the larger the hoist, the more awkward the arrangement.

A second problem with standard in-line hoists is the critical alignment of the center lines of the two drums. Assembling and maintaining large hoists underground must be accomplished, generally in tight quarters, under extremely adverse conditions.

A third problem is the placement of the slusher operator. An operator behind a large hoist often has a limited view of the actual scraping operations and the chute or car being loaded.

Still a fourth problem is the tendency toward bad rope winding since often troublesome fleet angles must exist if the hoist is to be placed advantageously for the operator—in other words, close to the dumping point.

Of course, any lessening of such restrictions "is devoutly to be wished."

To obviate these preclusions of slushing efficiency, heavy-duty hoists for underground service are now being designed as tandem units. The return drum on a hoist of this type is placed behind and slightly above the pull drum, and the driving motor is placed behind the return drum. Such an arrangement results in an overall width only slightly greater than the width of a single drum. Controls (with either manual, air or hydraulic operation) are located beside and to the front of the forward drum for a clear view of the scraper.

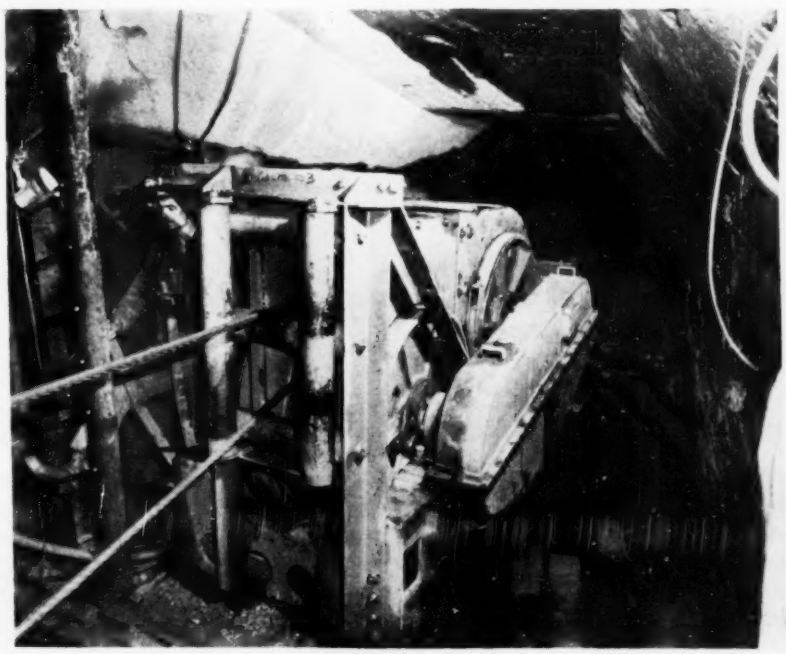
As an example of heavy-duty, underground, tandem slusher-hoist installations, the 150-hp. Vulcan-Denver hoist that is operating in a concreted slusher drift under a caving block in a large western underground property typifies recent advances in design. This unit is placed to move ore passed through draw raises to a box-hole leading directly to the haulage level. Since no grizzlies are used, particle size is limited only by the size of the raises and the 10-ton cars that are loaded. A 72-inch scraper is used in this installation.

Probably the greatest single advantage of this hoist is the limited space required for installation and operation. A drift with but a 7-foot width will accommodate both machine and operator and afford ample space for operation and accessibility. The hoist disassembles quickly into four pieces—two single drum assemblies, the motor, and the frame.

Power is transmitted from the motor to the drums by chain drives, eliminating the critical alignments necessary with standard single-shaft hoists. Chain drives have provided both flexibility and strength. The primary drive from motor to the rear drum uses a 4-strand, 1¼-pitch roller chain. The secondary drive connecting the two drums is a double strand, 2-pitch roller chain. Both drives are carried in oil-tight chain cases of heavy gauge steel plate. Both drives are continually lubricated by the splash system. The external drum shaft bearings are grease lubricated through fittings.

Clutch design incorporates large surfaces to hold heat formation to a minimum, and wearing blocks, mounted on the drums, that are engaged by two semi-flexible posts of the Servo-acting type.

Though this example of slushing concerns its use only in block caving, the principles can be widely applied since many of the same problems—and therefore many of the same advantages—are common to any operation where continually larger hoists are needed to increase production and efficiency.



One of the latest heavy-duty slusher installations uses a Vulcan-Denver unit in a large western block caving operation. The clear view afforded the operator is limited only by the ladder-type guard that protects him. Other advantages offered include limited drift width required, and the ease of assembly and repair.

How Allis-Chalmers MOTOR SCRAPERS Help Cut Cost per Yard

Positive, forced ejection . . . eliminates wasteful circling or other time-consuming methods of removing the load. Allis-Chalmers' patented forced-ejection system plus high apron lift *bulldozes* dirt out of the bowl fast every trip . . . without extra wear and tear on power control unit cables and clutches.

Easy operation. From foam rubber seat to finger-tip control, shock-free hydraulic steering and full visibility, a TS-300 operator has every available help for safe, sure, speedy work. Balanced weight distribution and low center of gravity make A-C MOTOR SCRAPERS easy to maneuver even at top speed.

Faster, easier loading . . . because A-C MOTOR SCRAPERS have up to 20 hp. to handle every struck yard . . . plus offset cutting edges and "center-boiling" loading action that spills the dirt evenly, filling corner voids for full capacity loads.

High-speed hauling. The power behind the TS-300 teams up with big, traction-type tires that gear it to the road . . . move capacity loads at 22.5 mph. And operating clearance of 20 in. helps keep it from hanging up on rutted haul roads.

by Cutting Time per Yard

A dirt-moving "package" that makes every second count. The powerful HD-20 torque converter tractor is an ideal teammate for the TS-300. It synchronizes to scraper speed at contact . . . automatically loads at fastest speed conditions permit with less strain on operator and equipment . . . gives scraper an extra fast start to the fill.

Your nearby A-C dealer will be glad to give you more yardage-boosting facts about job-tested, *job-proved* MOTOR SCRAPERS. He can also tell you where you can see them at work and talk to the men who own and operate them. You owe it to yourself to call or stop in soon.

TS-300 MOTOR SCRAPER	TS-200 MOTOR SCRAPER
14 cu. yd. struck capacity	10 cu. yd. struck capacity
18 cu. yd. heaped capacity	13 cu. yd. heaped capacity
280 hp. Buda diesel or	176 hp. Buda diesel or
275 hp. Cummins diesel	165 hp. Cummins diesel

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

THE FINEST LINE ON EARTH

John D. Mitchell Tells of

LOST MINES AND BURIED TREASURES

THE LOST SAN ANTONE PLACERS

In the year 1600, an expedition of several hundred men set forth from the City of Mexico. Their goal was a fabulous deposit of placer gold from which the Indians had been reported to have collected an immense amount of pure gold from the surface of the ground. The party traveled north over the Devil's Highway to a point where the little town of Tubac now stands. They remained at Tubac for several weeks, refreshing themselves and their animals, then headed northeast over the old Spanish trail that lead through Doubtful Pass. This trail crossed the desert north of where Lordsburg now stands and continued on to the eastern part of New Mexico and the placer deposits.

Old records show that the mines were worked for a number of years. A visita (branch) of the church was established at the camp and accounts sent back to Spain indicate that the placers produced more than $30,000,000 in gold.

The old Spanish custom of enslaving the Indians and forcing them to work in the mines was resented by the Indians and they secretly planned a revolution that would free them from oppression. So while the Spaniards spread the doctrine of Christ and collected gold, the Indians succeeded in organizing their forces. In the year 1616, they suddenly attacked the camp and killed most of the Spaniards. The few who survived barely escaped with their lives.

Except for the "Royal Fifth" which was sent immediately to his Majesty, the King of Spain, the millions in placer gold that had been collected during the 16 years that the mines were operated was left buried in a secret hiding place in or near the old camp. No effort on the part of the Spaniards was ever made to reopen the mines until the spring of 1800, just 184 years later. At that time, San Antone organized an expedition to relocate the old placer diggings.

With waving plumes and shining banners, the expedition set forth from the City of Mexico. After several months of travel to the northwest they rediscovered and relocated the placers for the Crown of Spain.

Because of the small number of men in his party, San Antone was unable to work the mines. He did succeed, however, in getting out of the Indian country with about $2,000,000 worth of gold. He headed for a mission down on the coast where he planned to obtain assistance so he could return with a larger force and reopen the mines. Stakes were driven frequently as the party crossed the plains to serve as a guide to the mines when they returned.

After many difficulties the party finally reached the place where the city of San Antonio, Texas now stands. There San Antone fell ill and died. Indians and desperadoes murdered the rest of the party for the gold they carried when an attempt was made to reach the coast. The stakes which had been driven along the trail were knocked down or destroyed by buffalo, and once again the mine was lost.

Copies of church records brought from Spain by a former governor of Baja California indicate that some $25,000,000 to $30,000,000 in placer gold still lies buried somewhere around the placer diggings, possibly in an underground room below the church. Yellowed maps left by the Spaniards indicate that the fabulously rich diggings were located somewhere along the headwaters of the Rio Prieto (Black River).

The stakes which had been driven along the trail were knocked down or destroyed by buffalo, and once again the mine was lost.

Sulphur Processing Plant To Be Built In Mexico

A $5,000,000 plant to process sulphur at Jaltipan in southern Vera Cruz, Mexico will be built by the Pan American Sulphur Company. Construction is expected to start next February and should be completed by August 1954.

The plant will be erected on concessions totaling 22,000 acres around the salt dome at Jaltipan, and will be capable of producing between 300,000 and 600,000 long tons annually by the Frasch process. Through a subsidiary, Gulf Sulphur Company de Mexico, S.A., Pan American has been able to explore the area, and to date 80 core holes have been drilled. Estimates are that the dome contains over 10,000,000 tons of sulphur reserves.

The company has obtained an eight-year loan from the U.S. Export-Import bank amounting to $3,664,000, and plans a stock offering of $3,000,000.

THE ENGINEER'S REPORT

DATA

PRODUCT Chevron Starting Fluid

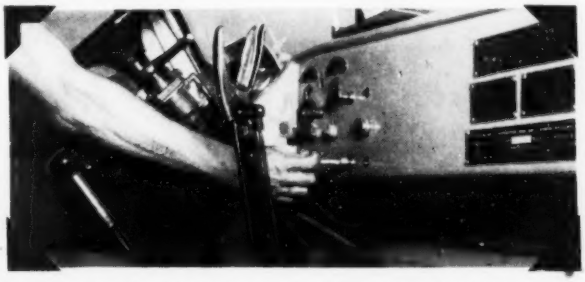
UNITS Diesel engines

CONDITIONS Sub-zero temperatures

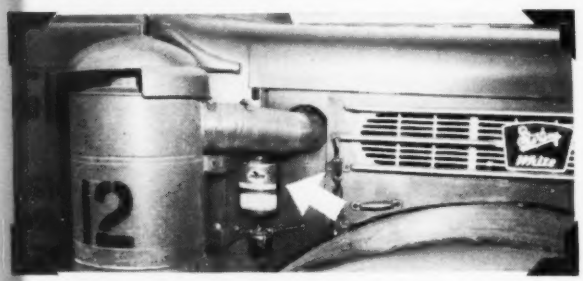
EQUIPMENT Permanent dash-mounted primers—bulk storage tanks

FIRM Picco Logging Co., Montesano, Wash.

Diesels start instantly at 20° below zero!

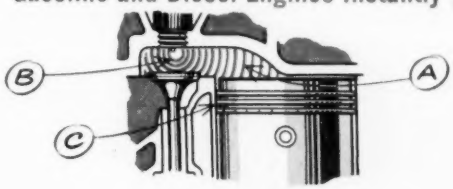


PRIMED WITH CHEVRON STARTING FLUID, diesel engines in Picco Logging Co. trucks "start instantly, even in winter temperatures that sometimes reach 15° and 20° below zero," according to E. W. Picco, owner. Previously, the company lost from 10 minutes to an hour a day in starting each truck. And often, when left out overnight, trucks had to be towed before they would start. The dash-mounted pump shown above is worked once or twice as the engine turns over, forcing fluid through atomizers into manifold.



MOUNTED NEAR THE ENGINE, this storage tank holds bulk Chevron Starting Fluid. It is also available in 7- and 17-CC gelatin capsules. These capsules are placed in a puncturing tool, and fluid is pumped into intake manifold the same way as from the central bulk tank shown. Each type of dispensing equipment is suitable for both diesel and gasoline engine and is available from your starting fluid supplier. Chevron Starting Fluid is approved by leading engine manufacturers.

How CHEVRON Starting Fluid Starts Gasoline and Diesel Engines Instantly



A. Atomizes in lowest temperatures and provides powerful, easily ignited vapor in combustion chamber.

B. Pressure, or the weakest spark, fires mixture—turns engine and heats air for regular fuel mixture.

C. Contains lubricant and additives—inhibits cylinder wear, and ice formation in primer equipment.

HOT NEWS — COLD ENGINES

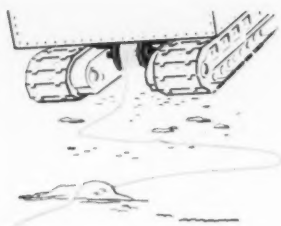
FREE BOOKLET gives you more facts on Chevron Starting Fluid—shows where it should be applied in different type engines. Write or ask for it today.

CHEVRON STARTING FLUID

TRADEMARK REG. U.S. PAT. OFF.

FOR MORE INFORMATION about this or other petroleum products of any kind, or the name of your nearest distributor handling them, write or call any of the companies listed below.

STANDARD OIL COMPANY OF CALIFORNIA • San Francisco 20
THE CALIFORNIA OIL COMPANY • Barber, New Jersey
STANDARD OIL COMPANY OF TEXAS • El Paso
THE CALIFORNIA COMPANY • Denver 1, Colorado



proved in our mines for better performance in yours

We—at Anaconda—are miners ourselves. We know shovel cable because we use lots of it. Safety and uninterrupted flow of power are important in any mining operation. In both respects we know Securityflex Type SH-D has a good record.*

for longer "failure-free" service on big shovels, insist on Butyl-Insulated Securityflex above 2kv

This is Butyl-Insulated Securityflex Type SH-D. For your drills use patented rubber-cored Type G Securityflex Portable Cable.

ANACONDA Securityflex Cable is safer, less liable to "blow-out," easier to work with. Here's why.

BUTYL INSULATION. This accounts for improved resistance to moisture, ozone, heat (up to 80C).

NEOPRENE JACKET. Here is real flexibility and great strength engineered for this specific tough use. Handles well, has high impact resistance and lasts longer in all weather.

RUBBER-CORED GROUND WIRES. This safety-first feature prevents kinking, gives greater shield contact, and cushions the wires.

COPPER-COTTON SHIELD. Special new-type shield makes splicing easier, faster without damage to insulation. Eliminates chafing failures.

Ask your Anaconda Sales Office or Distributor to show you this and other ANACONDA portable mining cables. Learn how continuous improvements have made these famous cables better . . . for safety . . . and for increased production at less cost in your mine. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

*Trademark 62B80

the right cable for the job ANACONDA® **wire and cable**

ACTIVITIES OF U. S. MINING MEN

Max J. Kennard has been promoted from chief engineer of the Combined Metals Reduction Company at Salt Lake City, Utah, to manager of the Pioche Manganese Company at Las Vegas, Nevada. **K. K. Hood**, former general manager of Callahan Zinc-Lead Company, will succeed him at Combined Metals. Other additions to the staff of Pioche Manganese, a subsidiary of Combined Metals, are **R. W. Lottridge**, manager of the Henderson plant; **F. R. Leonard**, metallurgical assistant to the general manager of Pioche Manganese; **F. B. Peterman**, assistant plant manager at Henderson; **J. T. Crawford**, office manager; **Frank P. Souders**, plant superintendent; **L. J. Hartzell**, chief chemist, and **Ray E. Kirk**, master mechanic. Appointments at the Castleton, Nevada operation of Pioche Manganese include **James F. Orr**, to plant superintendent and **E. R. Butze** to kiln superintendent.

F. S. Oakberg has been advanced to assistant concentrator superintendent at the McGill, Nevada, plant of Kennecott Copper Corporation. He has been employed in various capacities at McGill since 1943.

Quenton L. Brewer and **Isadore Million** are the first of several new additions to be made to the exploration branch of the U.S. Atomic Energy Commission at Grand Junction, Colorado. Mr. Million has been working at Pinedale, Wyoming and Mr. Brewer was with the Defense Minerals Exploration Administration.

Clifford F. Hood was recently elected president of United States Steel Corporation and a member of the board of directors. **Benjamin F. Fairless** will continue as chairman of the board and chief executive officer of the corporation. **Robert C. Tyson** was elected vice chairman of the finance committee; **Harvey B. Jordon** is new executive vice president in charge of operations of the corporation; **Walter F. Munford** was appointed president of the American Steel and Wire Division of U. S. Steel; **Howard E. Isham** was elected vice president and treasurer of the corporation, succeeding **Max D. Howell**, who has retired.

Earl W. Donahue is new works manager of the El Paso, Texas copper refinery of Phelps Dodge Corporation, succeeding recently retired **William Knowles. B. B. Kunkle** will follow Mr. Donahue as assistant works manager.

New additions to the **M. A. Hanna** Company engineering staff are **Jack Maney, T. M. Coughlin** and **Frederick Bloomfield.** All three will be located at Cooley, Minnsota. Mr. Maney is the son of **J. J. Maney**, superintendent of the Webb mine for the Snyder Mining Company, and Mr. Coughlin is the son of **D. E. Coughlin**, superintendent of Pickands, Mather & Company's Danube mine at Bovey, Minnesota. Mr. Bloomfield was employed by the Hanna engineering department prior to joining the armed services two years ago.

SHELDON P. WIMPFEN (left) is now directing the new Operations Office of the U. S. Atomic Energy Commission at Grand Junction, Colorado. Formerly assistant director of the Division of Raw Materials in Washington, Mr. Wimpfen will direct both the exploration and procurement programs of the AEC, as a result of a recent consolidation of the two. **FRANK MACPHERSON** (right), who had been manager of the Colorado Raw Materials Office, will be director of production under the new system, and will continue to be responsible for ore buying, processing and uranium concentrate procurement.

Cleveland Cliffs Iron Company recently announced the following appointments at its Minnesota properties: **Paul Swanson**, former superintendent at the Hawkins mine, to superintendent at the new Sargent open pit mine at Keewatin; **William LeClair** to assistant superintendent at the Hawkins mine; and **Melvin Viant** to assistant superintendent of construction at the company's Mesabi range operations.

Dick May has returned to Wallace, Idaho after directing the installation of electrical wiring and equipment at American Smelting and Refining Company's Van Stone operations in Colville, Washington.

R. D. Hill has been elected executive vice president of Taylor-Wharton Iron and Steel Company of Cincinnati, Ohio. He will set up offices in High Bridge, New Jersey, and will coordinate all activities and operations at the company's manganese steel foundry at High Bridge and at its forged steel cylinder and railroad trackwork plant at Easton, Pennsylvania. Mr. Hill will also continue to act as chief financial officer of the company.

Pierce C. Walker has been appointed manager of operations for the Colorado Standard Lead-Zinc Mines, Inc. at Lake City, Colorado. He was promoted from mill superintendent.

Robert M. Reininger was recently elected executive vice president of the New York and Honduras Mining Company. He previously was assistant to the president.

Stanley Hughes, who designed and supervised the construction of the new Kennecott copper refinery at Garfield, Utah, is now in charge of the smelting and refining operations of the Kennecott Copper Corporation in Utah.

Russell Bartz has been promoted to pit foreman at the South Agnew mine, Hibbing, Minnesota, He began his mining career in 1941 at the Patrick washing plant, then operated by Butler Brothers.

Harry A. Brenn is the latest addition to the Defense Materials Procurement Agency's Region IV office in Singapore. In his capacity as director of development, he will serve as principal assistant to **Rear Admiral Paul L. Mather** (U. S. Navy, ret.), who was appointed director of Region IV in October.

Thomas K. Graham is new assistant general superintendent of the Great Falls, Montana Reduction Department of Anaconda Copper Mining Company. Other Anaconda personnel receiving promotions included **Guy T. Wever** to succeed Mr. Graham as superintendent of the electrolytic zinc plant; **Clarence V. Saylor** to assistant superintendent of the copper refineries; and **Charles**

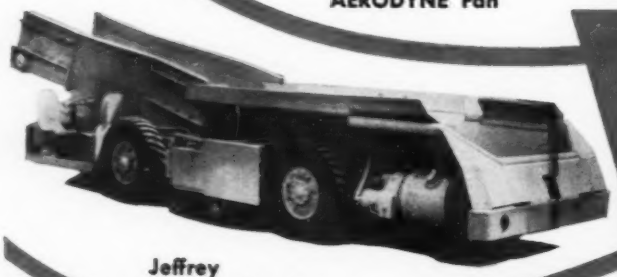
Anaconda Copper Mining Company has made additional promotions within its staff at Butte, Montana. Left to right: ARTHUR C. BIGLEY, formerly manager of mines, has been named general manager of western mining operations; EDWARD I. RENOUARD, formerly general superintendent of mines, becomes manager of mines; and A. R. SIMS, formerly assistant general superintendent of mines, has been made general superintendent of mines. Other advancements included EDWARD BONNER, JR. to assistant general superintendent of mines, and JOSEPH CANAVAN to mine foreman of the Belmont mine.

Type 12-A
Jeffrey
AERODYNE Fan

Whether a question of proper ventilation or the most economical method of transportation you will find the answer in Jeffrey engineered equipment for Metal Mine operation.

For instance, the Jeffrey 12-A AERODYNE Fan operates at a lower speed yet still maintains the high efficiencies characteristic of these ventilation units over many years. And for low cost transportation Jeffrey offers sturdy, long-lived Locomotives (trolley or storage battery), Belt Conveyors and Shuttle Cars depending upon the nature of your operation.

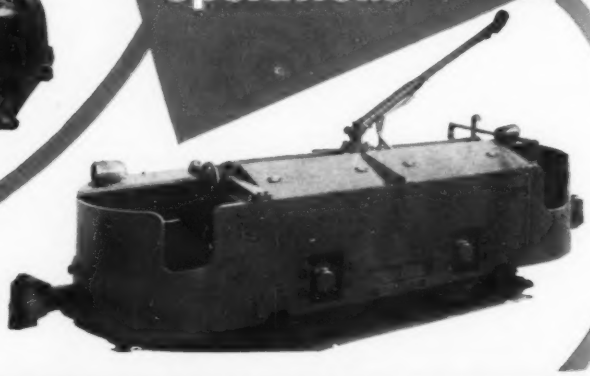
There is a Jeffrey engineer available to help you. Consult him on your needs.



Jeffrey
Shuttle Car

JEFFREY EQUIPMENT assures lower costs for your metal mine operations

64-A Belt Conveyor Head



THE JEFFREY MANUFACTURING COMPANY
974 North Fourth St., Columbus 16, Ohio
Established 1877

Complete line of Material Handling, Processing and Mining Equipment

Baltimore 2 Boston 16 Cincinnati 2 Detroit 13 Houston 2 New York 7 St. Louis 1
Beckley, W. Va. Buffalo 2 Cleveland 15 Forty Fort, Pa. Jacksonville 2 Philadelphia 3 Salt Lake City 1
Birmingham 3 Chicago 1 Denver 2 Harlan, Ky. Milwaukee 2 Pittsburgh 22

Jeffrey Mfg. Co. Ltd., Montreal, Canada
British Jeffrey-Diamond Ltd., Wakefield, England
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S. A.
The Galion Iron Works & Mfg. Co., Galion and Bucyrus, Ohio
Galion (Great Britain Ltd.), Wakefield, England
The Ohio Malleable Iron Co., Columbus, Ohio

ROGER O. OSCARSON, Spokane mining engineer and former secretary of the Northwest Mining Association, has been appointed minerals economist with the Bureau of Land Management's division of minerals with headquarters in Washington, D.C. Mr. Oscarson has held several other government positions—among them, with the Civilian Production Administration and the War Production Board. His most recent government employment was as Spokane district manager for the National Production Authority.

R. Hill to acting assistant mechanical superintendent. The appointments were brought about by the transfer of **R. G. Satterthwaite, J. F. Smith** and **Carl Lundborg** to the Anaconda Aluminum Company at Columbia Falls.

Carroll Searls of New York, secretary of the Newmont Mining Corporation, has succeeded his brother, **Fred Searls, Jr.**, as a director of the Hecla Mining Company at Wallace, Idaho.

John G. Hall has been named assistant plant manager of the National Lead Company's MacIntyre Development Corporation (titanium division) at Tahawas, Utah. He previously was general superintendent of the Chief Consolidated Mining Company at Eureka, Utah.

Thomas D. Olson has been appointed product metallurgist at the American Steel and Wire division, United States Steel Corporation in Duluth, Minnesota.

Lin D. Barry is now general manager of King Lease, Inc., operator of the famous Camp Bird mine at Sneffels, Ouray County, Colorado. He succeeds **Harold Worcester**, who has resigned to enter private consulting practice. Mr. Barry, who has been at the Camp Bird operation for the past two years, will supervise improvements being planned to increase production at the mine. New flotation cell units have been installed, and a new ball mill will be put into operation soon.

Oscar M. Wicken is the new manager of the Sunbright, Virginia division of the Foote Mineral Company. He previously was manager of the magnesia recovery plant of Northwest Magnesite Company at Cape May, New Jersey.

J. F. Frost, milling engineer for the Buchans Mining Company, Newfoundland, Canada, has been named mining engineer for the western department of American Smelting and Refining Company. He succeeds **J. C. Piercy**, who has transferred to New York.

Dr. Curt Teichert, Australian paleontologist, has been appointed to the staff of the New Mexico Institute of Mining and Technology as professor of geology at Socorro, New Mexico. Dr. Teichert will assume his teaching duties in the spring semester.

Arnold H. Miller is now in Cuba doing examination and planning work for his new employer, the Phoenix Primera Lead-Zinc mines. Mr. Miller, a consulting engineer from New York, will work in the Lajal-Manzanillo-Oriente area.

Robert E. Koski, mechanical engineer, has joined the Oliver Iron Mining Division's eastern Mesabi staff.

Leland Barrows is new chief of the Mutual Security Agency's special mission to Greece, succeeding **Roger D. Lapham.** Mr. Barrows had been deputy chief of the Greek mission since May.

G. B. O'Malley, Australian technical representative of North American Cyanamid, Ltd., is visiting the United States and Canada.

Walter S. March has been appointed lecturer in the Department of Geology, Montana School of Mines. Mr. March, who succeeds **Dr. E. S. Perry**, has spent all of his professional life in South America, except for a year in the geological department of the Anaconda Copper Mining Company at Butte, Montana. He has worked for the South American Development Company, the Andes Copper Mining Company, the Chile Exploration Company, and most recently was chief geologist for the west coast of South America for Anaconda Copper Mining Company and its subsidiaries.

H. J. Tillia, former western mines manager of Westvaco Chemical Division, Food Machinery and Chemical Corporation, is new exploration geologist for Eastern Mining and Metals Company. Mr. Tillia, who will make Singapore his headquarters, plans to examine deposits throughout Southeastern Asia.

John Q. St. Clair, mining engineer, has moved from Duluth, Minnesota to Norman, Oklahoma, where he will be located for the next few months.

Diamond Core drilling on contract is your key to lower operational costs.

Boyles Bros., leaders in the field of Diamond Drilling for over 50 years, are equipped to give you complete service in Exploratory and Blast Hole Drilling or Tunneling operations.

Mining men and contractors will find no job too big or too small for Boyles Bros.

Full information on request.

Boyles Bros. DRILLING COMPANY

1321 SOUTH MAIN STREET • DIAL 84-4401 • SALT LAKE CITY

Branch Offices

Colville, Washington — Telephone 181
Leadville, Colorado — Telephone 526

MAGMA COPPER COMPANY

Buyers of

COPPER, GOLD

AND SILVER ORES

MINES AND SMELTER AT

SUPERIOR, ARIZONA

International Smelting and Refining Co.

ANACONDA
from mine to consumer

Buyers of

Copper, Silver & Gold
Ores and Concentrates:

Copper Smelter—Miami, Arizona
Address: Ore Purchasing Department
International Smelting and Refining Co.
P. O. Box 1265
Miami, Arizona

Lead & Zinc Ores and Concentrates

Lead and Lead-Zinc Smelter, Lead-Zinc Concentrator } Tooele, Utah

Address: Ore Purchasing Department
International Smelting and Refining Co.
818 Kearns Building
Salt Lake City, Utah

Please establish contact prior to shipment.

BUNKER HILL & SULLIVAN MINING AND CONCENTRATING CO.

Mines and Smelter at Kellogg, Idaho

Buyers of:

Lead ores and concentrates, zinc concentrates, silicious gold ores.

Sellers of:

"BUNKER HILL" brand of refined Pig Lead, Slab Zinc, Cadmium crude Antimonial Lead and Leaded Zinc Oxide.

We are proud of our "BUNKER HILL" trade mark. It represents the highest quality of metals produced. We likewise strive to make "BUNKER HILL" known as a symbol of the highest quality in our relations with our employees, with our suppliers of ores and concentrates, with our stockholders and with the general public.

For information regarding ore rates and shipments Address:

BUNKER HILL SMELTER
Box 29
Kellogg, Idaho

AMERICAN ZINC, LEAD AND SMELTING COMPANY

Buyers of Zinc Concentrates Suitable for Smelting in Retort and Electrolytic Smelting Plants, also Buyers of High Grade Lead Concentrates.

Address Communications to Ore Buying Department

Paul Brown Building
ST. LOUIS, MISSOURI

423 Mills Bldg.
EL PASO, TEXAS

927 Old National Bank Building
SPOKANE, WASHINGTON

P.O. BOX 577
DUMAS, TEXAS

ACTIVITIES OF INTERNATIONAL MINING MEN

L. H. Lange, vice president of the Galigher Company, left Utah recently for an eight-month tour of Africa and Europe. The Salt Lake City firm has tin, gold, and lead-zinc interests on the African continent, and Mr. Lange will participate in flowsheet consultations for a new pyrite concentrater being built near Johannesburg, Union of South Africa. The pyrites will be burned to make sulphuric acid used in the treatment of uranium values. Mr. Lange will also visit tin mines in Nigeria, the Southern Rhodesia copper belt, and lead-silver-zinc mines in French Morocco. He will return to the United States via Paris and London.

H. R. Banks will assume new duties this month as consulting engineer for ore concentration at The Consolidated Mining and Smelting Company of Canada Limited. Successor to his former position as superintendent of the Sullivan concentrator is **A. G. Robertson**. Mr. Robertson previously was special assistant to the manager of the metallurgical division.

Recent visitors at Black Rock Mining Corporation holdings in Bishop, California and Tempiute, Nevada were **K. C. Li**, president of Black Rock Mining Corporation and chairman of the board of directors of Wah Chang Corporation, New York ore purchasing firm; **The Hon. Richard C. Patterson**, ambassador to Switzerland and vice president of Black Rock; **T. K. Li**, director of Wah Chang Corporation; **N. E. Nilsen**, director of King Island Scheelite, Ltd. in Tasmania and general manager of Associated Mining Companies, Fiji Islands; and **Jeff O'Malley**, of the Australian staff of American Cyanamid Company.

Fourteen West German mine safety experts are in the Rocky Mountain area studying accident-prevention methods, health measures, and mining practices. Meanwhile, seven American experts are now surveying Germany's coal industry in order to recommend other ways of improving production in the Ruhr. Members of the German team are: **Gustav F. Geck**, inspector of mines, Ministry of Economic Affairs, Bonn; **Kurt A. W. E. Beissner**, state mining supervisor, Clausthal Bureau of Mines; **Dr. Aural K. J. Berg**, senior inspector of mines, Ministry of Economics and Traffic, Landes Nordrhein-Westfalen; **Ludger H. Funder**, inspector, Bonn Bureau of Mines; **Fritz A. Graf**, inspector, Heissisches Staatsministerium; **Adolf H. G. Hoffman**, Bonn Bureau of Mines; **Herman F. R. Kahleyss**, Mining Trade Association; **Martin K. Richter**, senior inspector of mines, Dortmund Bureau of Mines; **Hugo Sanders**, senior inspector of mines, Dortmund Bureau of Mines; **Otto W. J. Schnase**, state mining supervisor, Clausthal-Zellerfeld Bureau of Mines; **Georg L. Schwarz**, senior inspector of mines, Bavarian Bureau of Mines; **Clemens R. Spannagel**, state mining supervisor, Baden-Wurttemberg; **Karl F. Schurmann**, secretary, National Union of Mines Workers, and **Carl G. Erlinghagen**, director, Mine Safety Department, Deutsch Kohlenbergbau-Leitung, Essen.

Christopher Spence was recently hired as a junior metallurgist in the concentrating department of the Andes Copper Mining Company, Porterillos, Chile.

Dr. Joseph A. Bancroft, consulting geologist for the Anglo American Corporation of South Africa, Ltd., is investigating Labrador mineral resources to see if they are similar in richness to those on the Reef and in Northern Rhodesia. Dr. Bancroft was one of the pioneer geologists who discovered Northern Rhodesia's vast copper deposits.

Robert Tolft has been appointed economic manager of the Svenska Metallverken (Swedish Metal Works), succeeding **Carl T. Ericson**.

Demetrio Andres, director of mines, and **Ramon Abarquez**, chief of the Geological Survey Division, represented the Philippine government at the International Geologic Congress held in Algiers recently. They are at present touring Europe, North Africa, the Middle East, India, and Southeast Asia gathering information on the most modern methods in mining, metallurgy, and petroleum refining and drilling techniques.

J. J. Young, general mine superintendent for the Raub Australian Gold Mining Company, Ltd., Pahang, Malaya, is on leave for several months, and is touring Western Australia.

E. C. Lane is new chief engineer for Frontino Gold Mines, Ltd. at Otu, Columbia.

Johan E. Boman has returned to Sweden after spending several years in the United States and Mexico, where he helped to introduce the Swedish lightweight Atlas rock drill. He can be reached at Falun, Sweden, where he is superintendent of mines for Kopparverket, a subsidiary of Stora Kopparbergs Bergslags A. B.

Dwight M. Lemmon is new project chief on a Point IV mission to Iran. While in the Middle East, Mr. Lemmon, a geologist for the U.S. Geological Survey, will make a three-month survey of Iranian mineralized areas, existing mining industry, equipment, facilities, local technical manpower, and will set up a priority schedule for exploitation of resources. He will also act as a technical adviser to the Iranian government and to the country director in the U.S. State department, as well as aiding in the selection of young Iranian nationals to receive technical training in the United States.

Thomas Sapp has joined the mining staff of the Baguio Gold Mining Company, located in Baguio District, Mountain Province, Philippine Islands.

A. G. Haritakis has been appointed mill shift boss for Barvue Mines, Ltd. in Barraute, Quebec, Canada. Mill capacity is 4,000 tons per day of concentrated zinc.

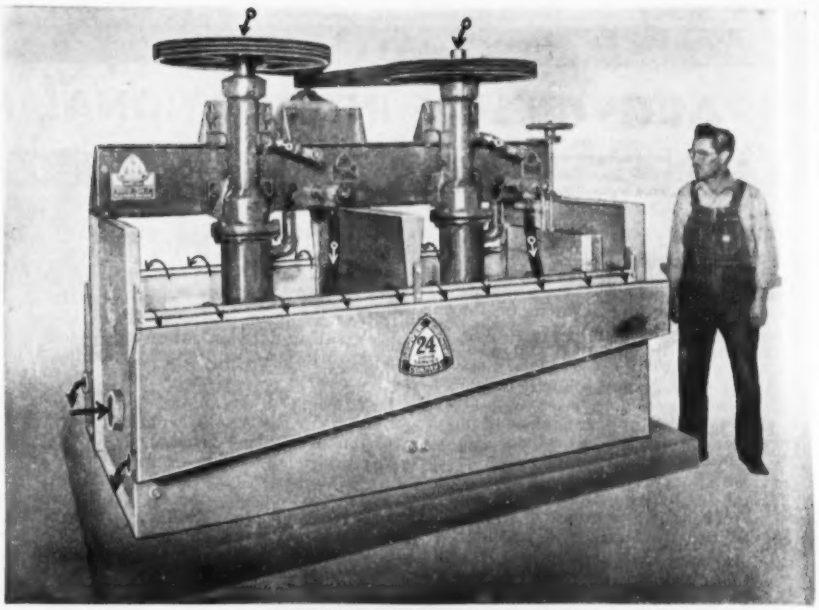
Parke A. Hodges of Behre Dolbear and Company is making mine examinations in South America.

Rudolph G. De Cecco is winner of the $2,000 undergraduate scholarship sponsored by Consolidated Mining and Smelting Company of Canada, Ltd. He is now studying mining engineering at the University of British Columbia, and is the son of **Silvio De Cecco**, a Cominco employee since 1929.

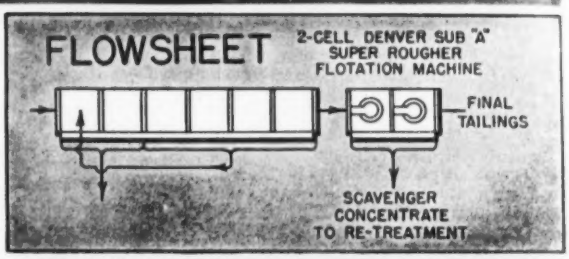
Scotty Ross, formerly a shift boss at Balatoc Mining Company, Baguio District, Mountain Province, Philippine Islands, has resigned and is now in Sumatra.

Mining problems of western Canada were reviewed at the annual meeting of the British Columbia section of the Canadian Institute of Mining and Metallurgy, held in Vancouver, British Columbia, October 20 through 22. Among the more than 400 delegates attending were (left to right): HARTLEY SARGENT, chief of the mineralogical branch of the British Columbia department of mines; W. S. ELLIS, manager of Comstock Keno Mines at Keno, Yukon Territory; DR. JOHN F. WALKER, deputy minister of mines, British Columbia; and N. E. McCONNELL, Photographic Surveys, Vancouver.

Recovery of minerals normally lost in tailings has been amazing due to use of the New Denver "Sub-A" Super Rougher Flotation Machine. The ability of these machines to lower tailings and *pay for themselves in a short time* has been proved.



NEW DENVER "SUB-A" SUPER ROUGHER REALLY GETS PROFITS FROM TAILING CIRCUIT

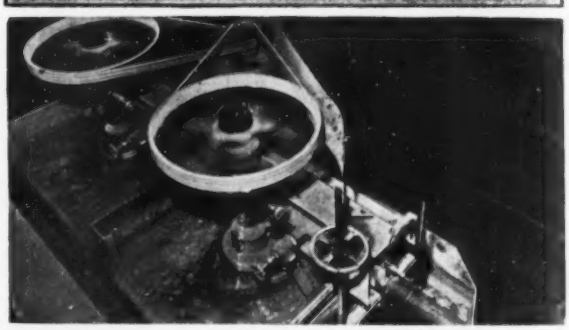


New "Sub-A" Principle

The New Denver "Sub-A" Super Rougher Flotation Machine has a double impeller mechanism—one imposed above the other. The upper impeller gives additional aeration and lifts lagging mineral over the froth overflow. This super aeration gives a deep frothy concentrate. The openflow type tank design handles large tonnage. Froth overflows both sides for quick removal of the difficult to float minerals. Many features of flexibility are provided to give the operator an opportunity to adjust cells for the particular ore being treated.

Trial Offer

We are so confident that Denver "Sub-A" Super Rougher Flotation Machines will lower tailings in your mill that we want you to see for yourself what this machine will do. We will send you one of these NEW Denver "Sub-A" Super Rougher Flotation Machines to try out in *your* mill. If you are not satisfied, just return the machine to us without obligation.



ABOVE: Operators estimate $30,000 per year saved by lowering tailings losses. BELOW—another new large mill equipped with Denver "Sub-A" Super Rougher Flotation Machines. See for yourself in your own mill what they will do for you.

DENVER EQUIPMENT CO.
1400-17th STREET
DENVER 17, COLORADO
Phone Denver CHerry 4466

. . . Over 25 years of Flotation Engineering

Denver Disc Filters

Denver Reagent Feeders

Denver Standard Dryers

Denver Ore Feeders

Denver Wilfley Tables

Denver Crushing Rolls

INTERNATIONAL NEWS

$4,000,000 Subsidy For Canadian Gold Miners

Canada's gold mining industry will receive an additional $4,000,000 in assistance from the government this year, an average increase of $1.00 per fine ounce of gold produced. Previously miners received a subsidy of $2.80 per fine ounce on average, and now will receive $3.80.

The industry has long been hard-pressed between rising production costs and a fixed price for its product, and was more recently adversely affected by the premium value of the Canadian dollar which forced the selling price down $5.00 an ounce to $33.60. Under the new arrangement, producers should receive $38.00 an ounce, as compared to the official price of $35.00.

The plan was developed in at attempt to halt a procession of shutdowns which have reduced the number of operating mines from 140 in 1941 to 60 in 1952. The increase will be provided by broadening the formula for the calculation of assistance payments and by changing the method of calculating the rate of assistance element in the formula. The Emergency Gold Mining Assistance Act in its present form defines the rate of assistance as one-half of the excess of the cost of production per ounce over $22.00 with a maximum of $11.50. The act will be changed so that the rate of assistance is one-half the excess of the cost of production per ounce over $18.00, with a maximum of $13.50.

Develop Copper Deposit In French West Africa

The Territorial Assembly of Mauritania, French West Africa, has agreed to the formation of the Societe des Mines du Cuivre de Mauritanie for the exploration and development of the large copper deposit at Akjoujt. The company has an initial capital of 600,000,000 French Francs with the Mauritanian government and private companies each supplying equal proportions.

Since March 1952, the deposit has been prospected by the Bureau Minier de la France d'Outre-Mer, and its work indicates that the deposit is the largest ever found in the French Union. The deposit consists of a large, flat-lying lens of chalcopyrite varying in thickness from about 10 feet around the periphery to a maximum of 350 feet nearer the center. To the northeast of the lens is a large hill which is almost entirely mineralized with copper oxides predominantly malachite.

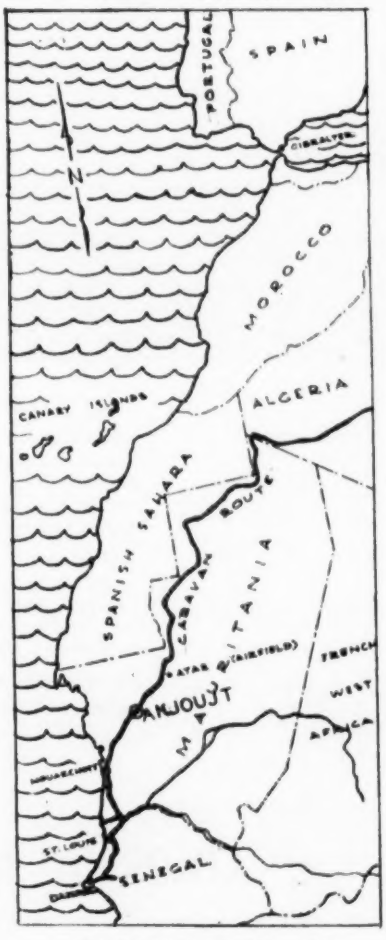
Indicated reserves to date are about 35,000,000 tons, averaging 2.0 percent copper and one to two grams of gold per ton. About three-quarters of the tonnage is sulphide ore in which the gold content is slightly lower than in the oxide ore.

Drilling is continuing to delimit the periphery of the deposit. This drilling has indicated that virtually the entire deposit can be mined by open pitting.

Akjoujt is an oasis about 280 kilometers from the Atlantic Ocean on camel caravan route No. 1. While there is enough water there for nomadic caravans, it will be necessary to pipe water to the area for any large-scale operation from a recently discovered and important underground water reservoir between 100 and 120 kilometers distant. This water discovery is of great importance in this semi-desert area of high temperatures and frequent sandstorms where the annual rainfall is a maximum of four inches.

Important problems remain to be solved before the deposit can be brought into large-scale production. Metallurgical problems, in particular, remain to be solved and a successful solution will be of the greatest importance. Transportation, power supply, water, and living quarters must also be solved. Initial studies have indicated the feasibility and desirability of treating the ore and refining the concentrates on the spot in order to produce metallic copper for shipment.

Place-fix map of the Akjoujt copper deposit.



US Tin Mission's Report On Malaya Now Released

The long-awaited report of the United States Tin Mission to Malaya has been published. The Mission visited the mines, smelters, and tin markets in the Federation of Malaya in November 1951 at the request of the Government of the Federation of Malaya to determine and report to the United States the status of the Malayan tin mining industry.

The Mission stated in its conclusions that it "did not find any evidence of curtailment of output by the mining or smelting industries," that the "mining technology appears to be thoroughly modern," also that "exploration has been almost completely arrested," and that "the emergency, as the guerrilla activities in Malaya are termed, was found to pervade every phase of Malayan life."

Among the Malayan tin mines inspected by the Mission were the: Dredge No. 5 Ampang Tin Company, Ltd., Ton Onn Kongsi Mines, Colonel H. S. Lee's mine near Salak South, the Rawang Tin Fields dredge No. 2, the Renong Tin Dredging Company Ltd.'s dredge, and the Sin Seong Fatt mine. Chinese gravel pump mines visited were the Sin Cheong Hin Mining Company, Ltd., San Hing Kongsi Mine, No. 1 Tronoh mine of the Fong Seong Mines Ltd., and the Sun Mun Cheong Tin Mines Ltd. The dressing shed of the Kuala Kampar Tin Fields, Ltd. and the Penang smelter of the Eastern Smelting Company Ltd. were also inspected.

The report was dated "Singapore, November 22, 1951" and its release, after minor security editing, at this late time was due to security considerations in Malaya. Copies of the free report are available from *Mining World*.

Large Australian Copper Producer Closes Down

Australia's third largest copper producer, New Occidental Gold Mines of Cobar, New South Wales, has ceased production because of high operating expenses.

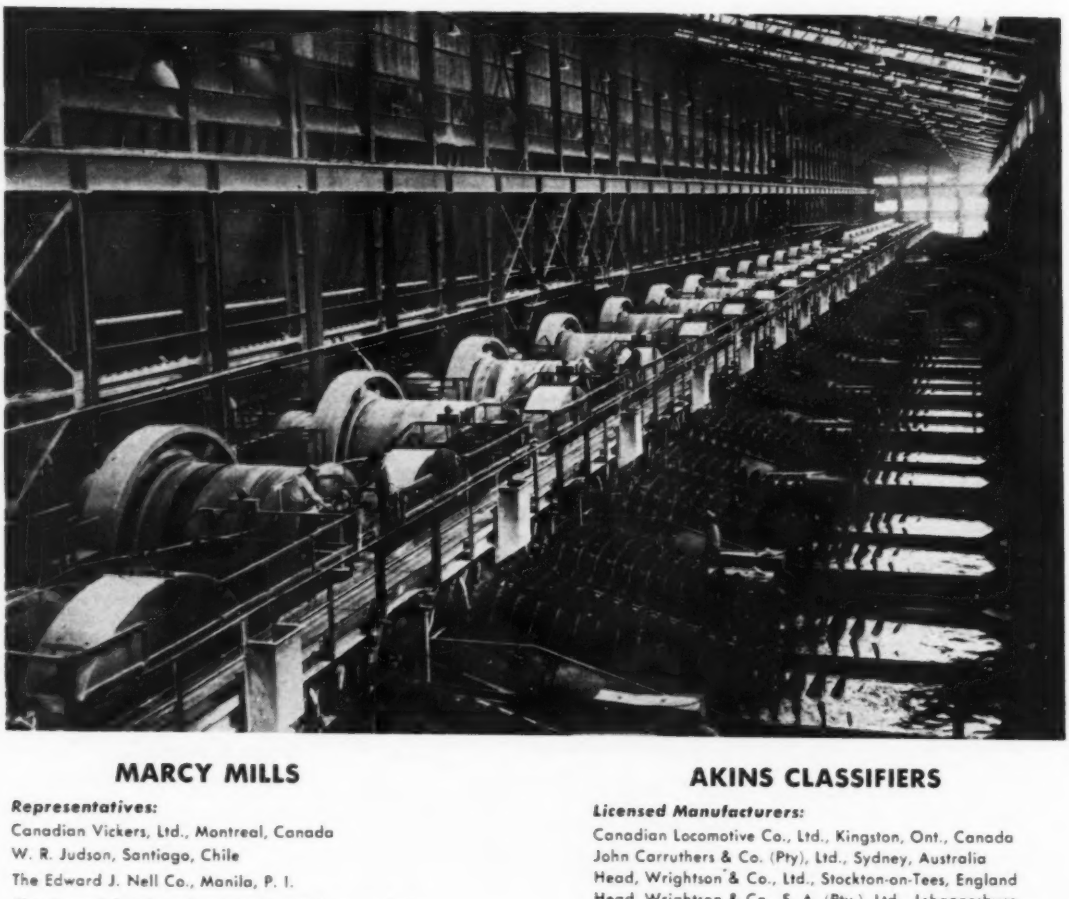
The chairman of the board of directors blamed a 40-hour work week, higher wages, higher materials costs, rail freight rates, and other cost factors as the reasons for the shutdown. He also cited the refusal of the Federal Government to allow gold producers to sell on the open market for U.S. dollars, and price controls on locally produced copper—still below the price for imported copper—as contributing factors. He commented that it would have been worthwhile for the Federal and State governments to have granted £A150,000 to the company for complete exploration of the Cobar fields which still contain millions in metals.

The company produced £A700,892 worth of gold and copper last year, but after expenses showed a loss of £A33,843 for the period, compared with a profit of £A82,658 in the previous year.

A Cost-cutting team

• MARCY MILLS • AKINS CLASSIFIERS

The many successful mining companies thruout the world who continue to place repeat orders for Marcy Ball and Rod Mills and Akins Classifiers prove the low-cost-per-ton performance of these machines.



MARCY MILLS

Representatives:

Canadian Vickers, Ltd., Montreal, Canada
W. R. Judson, Santiago, Chile
The Edward J. Nell Co., Manila, P. I.
The Austral Otis Eng. Co., Ltd., So. Melbourne, Austr.
Morgardshammars Mek. Verkstads Aktiebolag, Morgardshammar, Sweden
The Ore & Chemical Corporation, 80 Broad Street, New York City 4, New York
Representatives for Continental Europe

AKINS CLASSIFIERS

Licensed Manufacturers:

Canadian Locomotive Co., Ltd., Kingston, Ont., Canada
John Carruthers & Co. (Pty), Ltd., Sydney, Australia
Head, Wrightson & Co., Ltd., Stockton-on-Tees, England
Head, Wrightson & Co., S. A. (Pty.), Ltd., Johannesburg

Sales Agents:

Andrews and George Co., Inc., 5 Shiba Park, Tokyo, Japan
Continental Sales and Equipment Co., Hibbing, Minnesota
Edw. J. Nell Co., Manila, P. I.
Wright Bros., Credit Foncier Bldg., Vancouver, B. C., Canada

Let our engineers show you the proof . . . actual operating data for all kinds of grinding and classification problems.

The Mine & Smelter Supply Co.

Denver 17, Colorado

OFFICES IN SALT LAKE CITY, EL PASO, 1775 BROADWAY, N. Y. C.

AND ITS SUBSIDIARY COMPANY **COLORADO IRON WORKS CO.**

Denver 2, Colorado

Orinoco Awards Three Puerto Ordaz Contracts

The Orinoco Mining Company has signed three new contracts for construction of works at Puerto Ordaz, Venezuela, the Orinoco River terminal for the shipment of iron ore from the Cerro Bolivar mines to the United States.

The largest of the three was for 6,000,000 bolivares ($1,800,000), and was awarded to Empresa Nacional de Construcciones for the construction of the foundations to support the machinery and mobile equipment which will handle iron ore. A second contract went to Christian & Nielsen for building a power house and the installation of all electrical equipment, at a cost of 2,000,000 bolivares ($600,000).

Wannoni & Lacayo, Caracas firm, will build a complete water supply system; Ernesto Lilue, C.A., Caracas, will construct a workshop; seven frame buildings are to be built by Julio Gomez Capriles, Cuidad Bolivar. Three temporary warehouses are also included in the project.

Union Miniere Continues Germanium Oxide Studies

The Union Miniere du Haut Katanga in the Belgian Congo, is continuing development work on a process to recover germanium oxide from the smoke and dust produced by the roasting of zinc ores. Technical development is being partially guided by Professor Francis A. Meunier at the Polytechnic Institute of Mons in Belgium.

Although no new information is as yet available, a Union Miniere spokesman said earlier in the year that there is also a possibility of obtaining germanium associated with cornetite—$Cu_3 PO_4 (OH)$—which would simplify the extraction of the germanium oxide.

Meanwhile, the company is storing special accumulations of the dust from its Kibushi copper-silver-zinc mine, a large producer since 1925.

Colombian Government Seeks To Boost Mining

The Colombian government is seeking to stimulate mining by facilitating the staking of mining claims, and by granting the mining industry certain privileges.

Under a new law passed in October, mining claims can be staked by any person, citizen or alien, on all minerals other than oil, emeralds, and salt, by simply obtaining a permit from the Ministry of Mines to explore and exploit areas not over 250 hectares in area. This permit grants the mining rights for a period of ten years, after which a regular mining concession must be obtained if the operator desires to continue activities. No royalties or production taxes are paid during the first ten-year period.

The new law also exempts capital invested in mining properties from the annual patrimony law, and also permits the export of mineral products. Dollar import certificates obtained from these exports can be sold at a premium on the legal open market for importation of articles on the prohibited list of importations.

Formerly, a costly and tediously obtained government concession was required to explore and exploit minerals other than gold, silver, copper, and platinum. Also, the patrimony tax was levied on a sliding scale up to a maximum of 11 percent of the net assets of the company.

The new dollar import certificates sell on the open market for premiums of 25 to 50 percent over and above the official rate of exchange of 2.50 pesos per U.S. dollar. Foreign capital imported into Colombia for industrial use can be re-exported at any time together with the earnings of same.

The foregoing does not apply to the mining of gold, silver, and platinum because the claim staking and mining of these metals are already governed by very favorable legislation.

Bolivia Nationalizes Tin Holdings Of 'Big Three'

The Bolivian government has issued a formal decree nationalizing the mine holdings of Patino Mines and Enterprises Consolidated, Aramayo Mines in Bolivia Consolidated, and Mauricio Hochschild, S.A.M.I.

Henceforth the subsidiaries of the big three firms will operate as individual enterprises, under the following names: Caracoles, Chorolque, Animas Chocaya, and Tasna (Aramayo); Bolsa Negra, Colquiri, Morococala, Alantana, Unificada del Cerro de Potosi, Pulacayo, Matilde, and Venus (Hochschild); Kami, Japo, Huanuni, Catavi, Colquechaca, Oploca, and Viloco (Patino). Also included in this classification are the San Jose, Antequera, and Colavi properties. (All the above proper names will be preceded by "Empresa Minera.")

Bolivia ranks third in the world in tin production, contributing about 15 percent to the total supply. The three companies produce three-fourths of Bolivian tin exports, as well as 70 percent of the government's revenue.

According to present plans, the companies are to receive approximately $21,725,000 in compensation for the properties and equipment. Company officers say they are worth at least $60,000,000 and that they will fight both the nationalization and the settlement figure. Meanwhile the Bolivian government has filed a suit for $520,000,000 against the companies for alleged illegal foreign exchanges and income tax evasions.

December 31, 1953 has been set as the deadline for reaching final settlements, and the Bolivian government proposes to pay 3 percent interest to the companies on the valuations it fixed until such settlements are reached. It rated the Hochschild properties at slightly more than $9,250,000, Patino at just over $7,500,000, and Aramayo at $4,976,234.82. Patino is the only firm with a direct United States connection, since it is registered here and about 27 percent of its stock is in dollars presumably owned here.

Victor Andrade, Bolivian Ambassador to the United States, said it was up to the companies to show how much was spent abroad in order to obtain due compensation. He also stated that the taking over of the mines "does not mean a policy of nationalizing other properties and resources."

According to the preamble of the official decree, the Bolivian government bases its right to seize the properties on constitutional provisions and mining laws which state that all mineral reserves are the property of the state and may be leased to private parties "as long as the exploitation of mines has a character of public usefulness, to the benefit of the people." The remainder of the preamble sets forth a long list of grievances against the mining firms.

The nationalization is thought by some to be unconstitutional because of an article in the constitution which says that the state is empowered to regulate the practise of business and industry *by law* when public security or necessity requires such action. The seizure of the mines was accomplished by executive decree, not passed by the legislature, and therefore may not have the necessary legal weight.

Although at present tight control is being exercised over payment of salaries and stockholders' dividends in dollars, the government has promised foreign technicians equal or improved pay scales. To date there are no reports available on the overall situation, but groups of engineers have left the country and other supervisory personnel have refused to work under the new arrangement.

AEC Consolidates Uranium Exploration, Procurement

The uranium exploration and procurement programs of the U. S. Atomic Energy Commission on the Colorado Plateau have been consolidated under an operations office to be located in Grand Junction, Colorado.

The AEC previously maintained a raw materials office and an exploration branch in Grand Junction, but they have not operated under unified field direction. The new operations office will be responsible for the discovery, mining, and processing of uranium ores and for the purchase of uranium concentrates on the Colorado Plateau. The area to be served by the consolidation includes western Colorado, eastern Utah, and parts of northwestern New Mexico and northeastern Arizona.

Sheldon P. Wimpfen, former assistant director of the Division of Raw Materials in Washington, will be manager of the Grand Junction office and will report directly to the head of the AEC raw materials division. Frank MacPherson, previously manager of the Colorado Raw Materials Office, will assume a new title of director of exploration, but will continue to direct ore buying, processing and uranium concentrate procurement. Ernest Gordon will be director of exploration, and will have charge of exploration and geological work carried on directly by the AEC in the Plateau area. George G. Gallagher, assistant director for domestic production, and Philip L. Merritt, assistant director for exploration, will handle planning and technical direction of Plateau activities falling within their respective fields.

EASY SERVICING MEANS

Extra Output

THE service simplicity of Bucyrus-Erie's 38-B means less downtime, more time on the job . . . and more coal moved *every shift*. Here are a few typical reasons why:

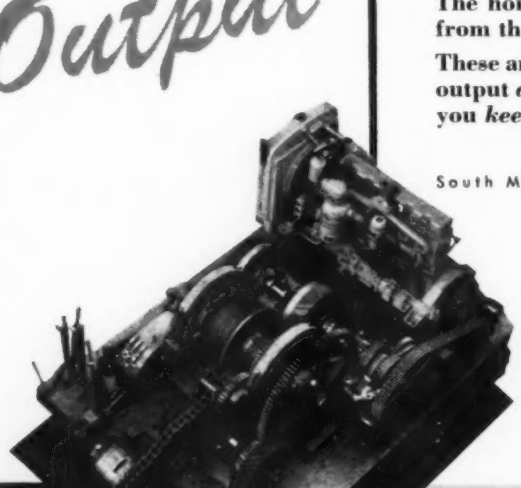
Easy-to-Get-at Lubrication Points — All parts requiring grease have fittings . . . and these are grouped for greatest convenience to the oiler.

Simple Adjustments — Each clutch has a single-point wear adjustment that is easy to make, stays accurately set. Clutches are self-adjusting for temperature variations, by means of pre-loaded spring compensators in the clutch linkage.

Time-Saving Maintenance Features — Transmission shaft is made in two sections for easy removal. Clutch housings can be taken off without removing the transmission shaft. The hoist gear has a split hub so that it can be removed from the drum shaft without need for a press.

These and many other servicing advantages add up to extra output *and* extra years of equipment life . . . and they help you *keep* the profit in your coal operation. 87E52

South Milwaukee **BUCYRUS ERIE** Wisconsin



Most Compared . . . Most Preferred

SOUTH AFRICA—The recently announced prices for tantalite-columbite by the United States government have caused a great deal of interest in South Africa. It has been pointed out that under the new higher price there are many office workers, farmers, etc., who work hard six days a week and earn less money per year than a good prospector-miner who recovers one ton of columbite-tantalite per year. Prospecting and mining operations are currently under way in the following districts: in Namaqualand, at Jackals Water, Henkies, the Goodhouse area, Pella, and Omsupkans; in the Transvaal, at Oshoek; at Mbabane and Ezulweni in Swaziland; and in the pegmatites in the Warmbad district of South West Africa.

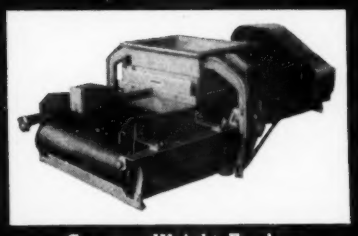
RHODESIA—Small tonnages of uranium ore have been proved at the south end of the Mindola Section of *Rhokana Corporation, Ltd.'s* mine. Further exploration is in progress to delimit this occurrence. Although the corporation's new electrolytic cobalt plant was commissioned early in 1952, the firm reports that it was not until August that production of cobalt metal really began. Certain operational difficulties common to all new processes first had to be overcome.

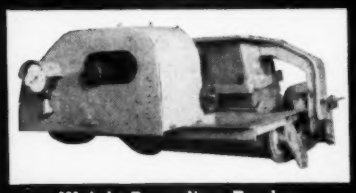
NIGERIA—*Taquah & Abosso Mines Ltd.* reports that it has reached a point where operation of its mines is no longer economical. The annual report showed that tonnage treated fell by 20,000 tons and gold production by 5,155 ounces, compared with the previous year. A government decree granting an increase in wages of African employes has raised costs, followed by a raise in the price of explosives and fuel oil. Ore reserves have become marginal at the present price of gold, even when working at full capacity which up to now they have been unable to do. The company says that if it could crush 23,000 to 24,000 tons a month, it could pay its way on a cash basis for a time but shortage of development would eventually bring things to a standstill. To support an adequate program of development, 28,000 tons would have to be crushed per month, for which 200 additional men would be needed underground. Even so, says the company, this would be simply consuming ore reserves to keep alive. Only an increase in the price of gold or a drastic reduction in costs can alter the situation.

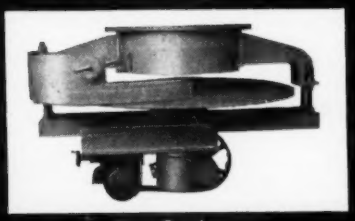
NORTHERN RHODESIA—Some geologists have discovered a coal deposit in the Valley of Zambese which the director of geologic research, M. H. Reeve, considers as the most important to be discovered in Northern Rhodesia. The deposit is located in the valley of the Kandabwe River, about 60 kilometers southeast of Bateka, within range of a railroad. Mr. Reeve declares that according to the results of the last prospecting, the seam would have a thickness of two to three meters. At first view, the coal seems to be of excellent quality. This deposit may well be a new source of fuel for the Rhodesian mines which have been using all of the wood available.

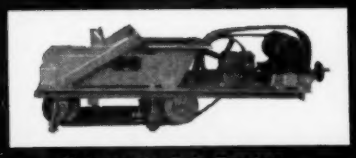
SOUTH AFRICA—*Blyvooruitzicht Gold Mining Company, Ltd.* has entered into a revised agreement with the South African Atomic Energy Board which provides for the expansion of the company's

IF
FEEDING
IS YOUR
PROBLEM
THEN CHECK THESE
HARDINGE
FEEDERS


Constant-Weight Feeders


Weight-Recording Feeders


Disc Feeders


Volumetric Belt Feeders

CONSTANT-WEIGHT FEEDERS regulate the feeding of materials at a **constant-weight** rate, rather than a constant-volume rate The feeder automatically compensates for changes in specific gravity and bulking, due to moisture, which would cause irregular feeding.

WEIGHT-RECORDING FEEDERS keep a record of the amount of material fed. Feeder is the constant-weight type equipped with recorder.

DISC FEEDERS are ideal for handling hot, sticky, or bulky materials without bridging or clogging.

VOLUMETRIC BELT FEEDERS are designed for simultaneous conveying and volumetric feed control

COMPLETE DATA on Hardinge Feeders available in Bulletin 33-D-3. Get your copy today.

HARDINGE
COMPANY, INCORPORATED
YORK, PENNSYLVANIA—240 Arch St. Main Office and Works
NEW YORK 17 • SAN FRANCISCO 11 • CHICAGO 6 • HIBBING, MINN. • TORONTO 1
122 E. 42nd St. 24 California St. 205 W. Wacker Dr. 2016 First Ave. 200 Bay St.

Recover Rare Earths With a YUBA Dredge

YUBA manufactures Revolving Screens and ARS* Perforated Plates which meet all requirements of finer screening for rare minerals such as monazite, scheelite, garnet and zircon. Illustrated above is 12-year-old YUBA Dredge #142, equipped with these new screens, dredging monazite at Cascade, Idaho, for owners Idaho-Canadian Dredging Company. It has 6 cu. ft. buckets and a portable pontoon hull so that moving to new properties is relatively easy.

YUBA ARS Screens are custom-built to fit your exact needs. They are made of abrasion-resisting steel with a Brinell hardness of about 230. Holes are taper drilled—closely spaced—diameters as small as 3/16".

JIGS ADAPTABLE TO RARE EARTHS

Because water and jig action can be closely controlled to suit the gravel, YUBA Jigs are particularly suited to the recovery of rare earths. Use them for primary recovery or to supplement tables and trap the small particles that often float away in older recovery methods.

BRING YOUR DREDGE PROBLEMS TO YUBA

YUBA engineers and shops—backed by 40 years of experience in designing, building and rebuilding dredges—can help you re-equip your present dredge for low-cost handling of rare earth and other precious minerals. Expert counsel on all dredging problems. No obligation. Write, wire or telephone **TODAY.**

YUBA #107, 3 cu. ft. buckets owned by H. & H. Mines, Inc. Over 15 years old, with portable pontoon hull, it was moved from its original property and re-equipped by owners for dredging scheelite at Henderson Creek, Montana.

YUBA DREDGES — PROVEN

YUBA MANUFACTURING CO.

Room 710, 351 California St., San Francisco 4, California, U. S. A.

AGENTS { SIME, DARBY & CO., LTD. · SINGAPORE, KUALA LUMPUR, PENANG.
SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.

CABLES: YUBAMAN, SAN FRANCISCO · SHAWDARBCO, LONDON

*United States Steel product.

operations in extracting uranium. In addition to treating current residues, the company will also treat the accumulated residues from its slimes dam and a larger plant than was originally planned will now be erected. The new plant, already under construction, will now cost about £3,358,100. It may be ready for operation early in 1953. The revised agreement also permits the company to receive a higher price for its product.

NIGERIA—During the year ended December 31, 1951, *Naraguta Tin Mines Ltd.* produced 254 tons of tin ore and 54 tons of columbite. Expenses per ton showed a considerable increase over 1950 figures, caused by increases in wages, tin royalties in their first full year of operation, and columbite royalties increased under Order in Council of June 12, 1951. Recovery values from the larger working places on the Korot areas were again less than were expected from the indications of very close prospecting, and while prospecting had indicated many new areas suitable for small-scale operations, no large deposits had been revealed. Tin ore reserves were estimated at 1,206 tons.

NORTHERN RHODESIA—*Mufulira Copper Mines, Ltd.* is building a new refinery, the first stage of which will produce 3,000 tons of electrolytic copper per month, and the second stage will double this production. The first stage, just about complete, will only produce cathodes. The second stage, to be ready in 1954, will be able to turn out various electrolytic shapes. For the year ended June 30, 1952, Mufulira reports that blister copper output fell by more than 10,000 tons despite an increase in mill grade. This was due to a reduction of about one eighth in the tonnage of ore hoisted, which in turn was largely the result of fuel shortage. Actual output was 76,369 long tons of blister, compared with 86,681 tons the year before.

NIGERIA—Uranium has been found in the Kaffo hills in Kano, but it occurs as a very small part of an ore called pyrochlore which occurs as minute specks scattered in granite rocks. It is doubtful if the uranium by itself is worth extracting, but fortunately it is associated with columbium. A means would have to be found for separating the pyrochlore from the rock—this would involve crushing thousands of tons of rock a day—and then extracting columbium and uranium from the pyrochlore. The Geological Survey Department has also discovered two iron ore deposits, one of which is near Enugu.

NORTHERN RHODESIA—With the completion of the power line from Chingola to Kitwe, the copperbelt power grid connecting the four mines of *Mufulira Copper Mines, Ltd., Roan Antelope Copper Mines, Ltd., Nchanga Consolidated Copper Mines, Ltd.*, and *Rhokana Corporation, Ltd.* to a central switching station near Nkana is now in full operation. The object of this arrangement, which has taken four years to complete, is to pool the individual power resources of each of the mines to the greatest advantage of them all. A preliminary survey is being made of the route of another line from the Lualaba River hydroelectric project in the Belgian Congo to the central switching station at Nkana. This line will cross the border into the Belgian Congo north of Chingola and will be 320 miles long, the longest transmission line with the highest voltage in Africa. Construction is due to be completed in 1956.

IN MINES and QUARRIES

JOB AVAILABILITY PAYS OFF!

Euclid Bottom-Dump Coal Haulers of 20 to 40 ton capacities have diesel engines to 300 h.p. . . . loaded speeds up to 34.4 m.p.h.

Rear-Dump Euclids of 10 to 34 ton capacity have travel speeds to 36.3 m.p.h. with full payload and diesel engines of 125 to 400 h.p.

For open pit mining and quarry operations, Euclids are unmatched for job availability and long service life. "Eucs" have large capacity and plenty of power and speed to move more loads per hour at more profit per ton.

Bottom-Dump Euclids are engineered and built as complete units with good weight distribution, and tremendous power. Short wheelbase of the tractor and the universal hitch design make them easy to handle and permit short turns in narrow cuts.

Rear-Dump "Eucs" have body designs for all types of materials—coal, ore, rock, overburden and other heavy excavation. Their rugged construction withstands the impacts of loading heavy materials and travel on rough roads—assures low operating and maintenance costs.

Put Euclids on the job and be on more jobs! Ask your Euclid Distributor for information on the models best suited to your off-the-highway hauling requirements.

The EUCLID ROAD MACHINERY Co.
Cleveland 17, Ohio

EUCLIDS

NORTH AMERICA

ONTARIO—The Export-Import Bank has approved a $5,000,000 loan to *Falconbridge Nickel Mines, Ltd.* to assist in the firm's expansion program. Falconbridge will provide about half of the money it needs for its planned program; other money will come from the United States Defense Materials Procurement Agency and the Export-Import Bank. The firm has a contract with the United States to provide not less than 60,000,000 pounds of nickel and 1,500,000 pounds of cobalt by 1961. It also has an option to deliver an additional 25,000,000 pounds of nickel and 25,000,000 pounds of copper. Most of the funds are to deepen the present main shaft, sink a new shaft, develop and equip the new *Hardy* mine, and expand capacity of its mill and smelter.

QUEBEC—*Fenimore Iron Mines Ltd.*, active in the Ungava-Labrador area, has announced through its president H. A. Strain, the discovery of a large deposit of siderite which can be operated by open pit methods. Siderite (ferrous carbonate) contains 48.2 percent iron when pure. No information is presently available as to the analysis of this deposit, but the indicated tonnage is very large.

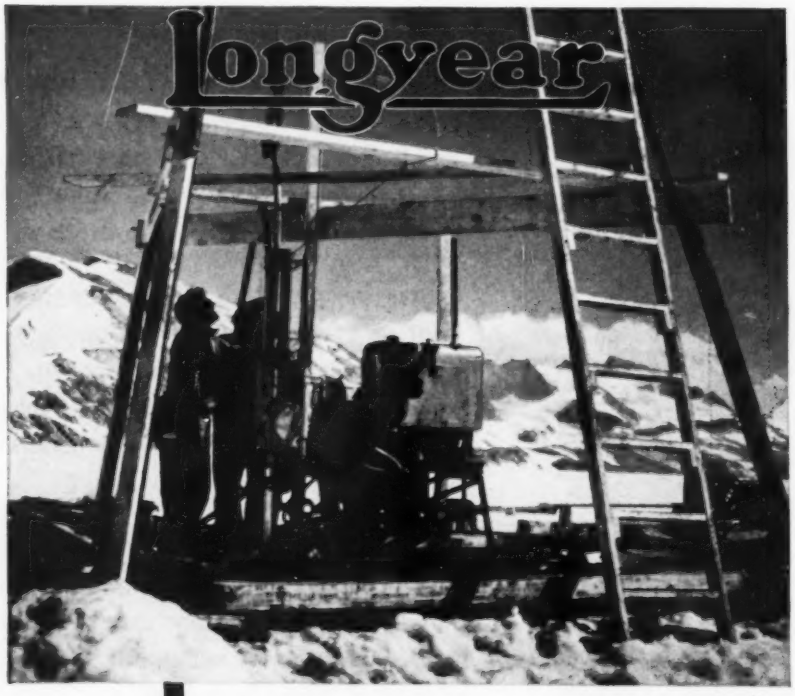
SASKATCHEWAN—*Hudson Bay Mining and Smelting Company Ltd.* has decided to sink a mine shaft at Birch Lake. A substantial program of diamond drilling has already been carried out and work has reached the point where the company feels it must continue exploration underground. Erection of headframe, hoist house, and compressor room and the start of shaft sinking are scheduled for the new year.

ONTARIO—*Falconbridge Nickel Mines Ltd.*, and *Ventures Ltd.* have taken under option a new nickel discovery near International Falls in the Rainy River. Exploration plans are being made and will soon be under way.

QUEBEC—*Barvue Mines Ltd.* has commenced milling operations at its new plant. All four units of the zinc mine have gone into production. Plans call for tonnage to be worked up to 4,000 tons a day as quickly as possible, with the 6,000-ton rate to be reached some time after January when sufficient hydro-electric power becomes available for all requirements. The management of Barvue reports that it is well pleased with the open-pit mining operations which have been proceeding since September 1952. Stripping of the open pit is 75 percent completed, and this work is continuing simultaneously with mining operations.

ONTARIO—Still another Canadian nickel area may be emerging as a result of the discoveries of the *Quebec Nickel Corporation*. The company has met with considerable success in the outlining of nickel-copper mineralization in the Werner Lake area, 65 miles north of Kenora, Ontario. Extensive diamond drilling was done on the property during the summer months. Work is now being directed to further exploration by diamond drilling and development of zones already indicated. A preliminary estimate by the company is 500,000 tons in the No. 1 zone averaging about 1.4 percent nickel and 0.7 percent to 0.8 percent copper with an average of $2.50 to $3.00 a ton additional in precious metals. Quebec Nickel Corporation is being financed privately by the same group which controls *Ascot Metals Corporation* and also *Eastern Metals Corporation*. Management includes Allen E. Rosen, president; Frederick E. Hall, vice-president; and the directorate includes Andrew Robertson, general manager of *Golden Manitou Mines*.

QUEBEC—*Eastern Metals Corporation Ltd.* announces that shaft sinking under power is scheduled to proceed immediately at its nickel-copper property 70 miles southeast of Quebec City. Sinking to a depth of 92 feet had been completed to date using temporary equipment. Objective of the present shaft sinking program is to provide three levels at 175, 325, and 475 feet from which lateral development will be carried on to develop the two ore zones—the north or nickel zone, and the south or copper zone. From surface diamond drilling results, the indicated tonnage in the north zone, taking an average width of 30 feet, is over 1,000,000 tons grading 0.81 percent nickel, 1.32 percent zinc. The south or copper zone has proven difficult to diamond drill from the surface because of adverse ground conditions, but preliminary calculations based on diamond drill results show over 450,000 tons grad-



CORES TELL THE STORY

First choice where the going's toughest

From the frozen Arctic to sweltering Africa, Longyear Diamond Core Drills have proved they are fast, rugged, dependable. Their smooth "straitline" power delivery speeds drilling progress, increases bit life. Compact, rugged construction makes their operation easy and cuts maintenance.

Select your drills from the wide choice of models, capacities and power units in the complete Longyear line. Write for General Bulletin 83.

E. J. LONGYEAR COMPANY
MINNEAPOLIS, MINNESOTA, U. S. A.
DIAMOND CORE DRILLS • CONTRACT CORE DRILLING • SHAFT SINKING
GEOLOGICAL INVESTIGATIONS

You wouldn't hunt big game with a pea shooter

. . . and with today's lower grade ores, you can't shoot for big production with yesterday's machinery.

TRAYLOR TC GYRATORY is built to maintain profits in expanded production

The extra-heavy construction and exclusive design of the Traylor TC assures greater profits when producing larger quantities of ore. The TC Crusher features Traylor's original, self-tightening bell head and curved concaves. These curved crushing surfaces are the secret of a Traylor TC's huge production and efficient use of power. For instance, a Traylor 42″ TC will produce 1290 tons of 6″ ore per hour on only 275 H.P. Traylor TC Gyratory Crushers are available in 7 sizes. Feed openings range from 20″ to 60″ . . . discharge openings from 1½″ to 9″. Write today for Traylor Bulletin 126 . . . get complete illustrations and specifications.

A **Traylor** LEADS TO GREATER PROFITS

TRAYLOR ENGINEERING & MFG. CO.
523 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P.Q.

Mail this coupon now!

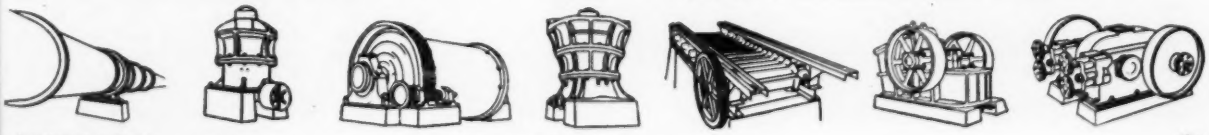
Send me complete facts about the Traylor TC Gyratory. (Bulletin 126)

Name: _____

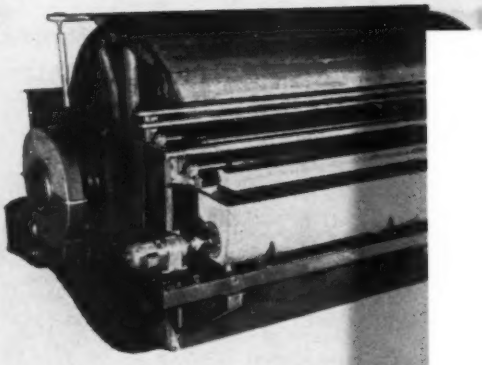
Position: _____

Company: _____

Address: _____ State: _____



EIMCO *String Discharge* FILTERS



Eimco String Discharge filters
where the nature of the cake ma
the string, to lift off the cake, a
feature.

Eimco String Discharge attachm
able for high or low submergenc
in a full range of drum size from
ft. of filter area and in laboratory
String Discharge filter is proportio
with 4 sq. ft. of filter area.

Eimco string discharge filters h
clusive advantages. Let our tes
help you determine the best a
your job.

EIMCO A411

THE EIMCO CORPORATION

The World's Leading Manufacturer of Vacuum Filtration Equipment

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 10, UTAH, U. S. A.

BRANCH SALES AND SERVICE OFFICES:

NEW YORK, 51-52 SOUTH STREET • CHICAGO, 3319 SOUTH WALLACE STREET
BIRMINGHAM, ALA., 3140 FAYETTE AVE. • DULUTH, MINN., 216 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIF., 637 CEDAR STREET
KELLOGG, IDAHO, 307 DIVISION ST. • LONDON W. 1, ENGLAND, 190 PICCADILLY

IN FRANCE: SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND: EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
IN ITALY: EIMCO ITALIA, S.P.A., MILAN, ITALY

ing 2 percent copper and goo pyrite content over an average widt of 2 feet.

IDAHO—*Giant Mascot Mines td.* reportedly has signed a contra with *Bunker Hill & Sullivan Mining a Concentrating Company* to sell all Mascot's lead concentrates for the ye (starting November 1, 1952) to Bunk Hill. The first shipment has alread been made to Bunker Hill's smelter at Kellogg, Idaho. Giant Mascot ope ates a mine and mill at Spillimacheen, British Columbia. Its mill capacity has been increased to 500 tons daily sinc last summer, and they have recently treated as high as 13,400 tons in a month.

QUEBEC—*Dominion Asbestos Mines Ltd.* has begun construction of a 2,200-ton mill and it is expected to be in production by March 1953. The property is located in Ham Township, 12 miles east of Asbestos, Quebec.

TIGH

BOU

BRITISH COLUMBIA—*Violamac Mines* will close down its small mill and begin shipping its ore to the *Western Exploration Company's* mill about nine miles away. The company expects to be able to triple present production by this arrangement.

ONTARIO—A uranium strike of "more than passing interest" has been made on a group of islands in northwestern Ontario known as the Manitou Islands. Samples tested after several months of surveying by Geiger counter are said to have run as high as 0.11 percent uranium.

NORTHERN TERRITORIES—*Salmita Consolidated Mines Ltd.* reports satisfactory progress in the winterizing program it is conducting at its Matthews Lake gold-tungsten property. The power house and mill buildings have been completed, and the Diesel plant is well underway. The shaft has been enlarged by the addition of a third compartment down to the 125-foot level in the form

of a separate manway on a system similar to that used by *Eldorado Mining & Refining* (1944) *Limited*. The original two compartments will carry the two skip cages operated by the new electric hoist. The shaft is to be deepened to 330 feet to open a second development level at 300 feet. All future shaft sinking is to be on a three-compartment basis, carried down as one unit to all levels below the first.

SASKATCHEWAN—Development at *Pitch-Ore Uranium Mines*, adjoining the southwest boundary of *Eldorado Mining & Refining* (1944) *Limited* in the Beaverlodge Lake area, is now to be concentrated on driving an adit to explore the ore structure. A series of 34 closely spaced diamond drill holes were put down this season, following an early exploration, to explore the main fault zone. Some 1,100-foot length of ore structure has been determined, of which

at the wholly owned Rocher De Boule which is a copper producer. Changes in the flowsheet have been made to recover a small percentage of tungsten.

LATIN AMERICA

MEXICO—Daily sulphur production at the plant of *Petroleos Mexicanos (Pemex)*, the official oil company, at Poza Rica is now 140 tons, according to Antonio I. Bermudez, Pemex director general. None of this sulphur is being exported at present; all production is being consumed by Mexican industry.

DOMINICAN REPUBLIC—The first iron ore shipment from this country to

HTLY

UND

zone consists of alteration within the granite adjacent and along a contact with two parallel basic mafic-dike like rocks. He reported that the zone bears considerable resemblance to the red carbonate granitic rock which contains the *Gunnar* uranium deposit. The firm reports that four large rock trenches are to be blasted at its *Felix Bay* property to provide a representative sample of the uranium-bearing zone which will then be sent to Ottawa for recovery tests.

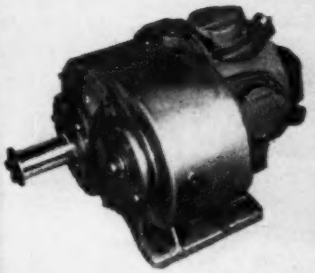
BRITISH COLUMBIA—*Western Uranium Cobalt Mines Ltd.* has changed its name to *Western Tungsten Copper Mines Ltd.* because the company has acquired tungsten and copper producing properties in the Hazelton area of British Columbia. The firm operates the *Red Rose* and the *Rocher De Boule* mines. The Red Rose, a tungsten and scheelite producer, is on long-term lease from the *Consolidated Mining & Smelting Company of Canada, Ltd.* on a royalty basis. A new 200-ton mill has been installed

since a good roadbed is a major requirement for efficient operation of the Rio Doce property. The entire route of the Vitoria-Minas Railway is now expected to be in good working condition by next June.

VENEZUELA—Iron ore production from January through September 1952 totaled 1,455,550 tons, compared with 841,341 tons in the same period of 1951. Of this figure, 1,265,617 tons were exported in 1952, while only 469,668 tons were exported in 1951. However, in 1951, exporting of iron ore did not begin until the last half of the month of March.

MEXICO—Though mining has contributed only two to three percent of Mexico's total annual income during the last few years, the industry provides one-third of the value of the country's exports and from five to ten percent of the government's yearly revenue, according to the Bank of Mexico and the Nacional Financiera, S.A., the government's fiscal agency. The two groups have been

Eimco
Dependable Geared Air Motors



Eimco Geared Air Motors are husky, powerful units built to work on a continuous operating basis with a minimum of attention.

All gearing, shafts and bearings are designed to work under continuous peak loads.

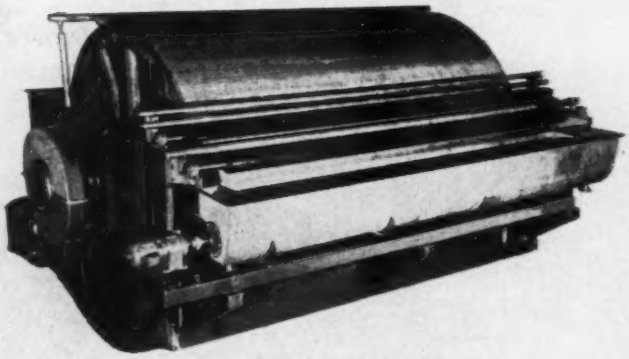
Power units are Eimco 5 cylinder, radial-type, reversible air motors. These motors have a high starting torque and work efficiently on pressures from 40 to 125 p. s. i.

Eimco Geared Units are available in three sizes, conservatively rated at between 7½ to 17 h.p., each with four different speed ratios.

Eimco Geared Air Motors are the only completely safe, completely dependable units.
Write for Bulletin AE6001.

EIMCO
THE EIMCO CORPORATION
The World's Largest Manufacturers of Underground Rock Loading Machines
EXECUTIVE OFFICES AND FACTORIES - SALT LAKE CITY 10 UTAH U. S. A.
BRANCH SALES AND SERVICE OFFICES:
NEW YORK 51-52 SOUTH STREET • CHICAGO 3319 SOUTH WALLACE STREET
BIRMINGHAM 6, ALA. 3140 FAYETTE AVE. • DULUTH, MINN. 216 E. SUPERIOR ST.
EL PASO, TEXAS WELLS BUILDING • BERKELEY, CALIF. 617 CEDAR STREET
KELLOGG, IDAHO 307 DIVISION ST. • LONDON W. 1 ENGLAND 190 PICCADILLY
IN FRANCE SOCIETE EIMCO PARIS FRANCE
IN ENGLAND EIMCO GREAT BRITAIN LTD LEEDS 12 ENGLAND
IN ITALY EIMCO ITALIA S.P.A. MILAN, ITALY

EIMCO *String Discharge* FILTERS



Eimco String Discharge filters are furnished where the nature of the cake makes the use of the string, to lift off the cake, a more desirable feature.

Eimco String Discharge attachments are available for high or low submergence drum filters in a full range of drum size from 25 to 678 sq. ft. of filter area and in laboratory size the Eimco String Discharge filter is proportionally designed with 4 sq. ft. of filter area.

Eimco string discharge filters have many exclusive advantages. Let our test laboratories help you determine the best application for your job.

EIMCO A411

THE EIMCO CORPORATION

The World's Leading Manufacturer of Vacuum Filtration Equipment

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 10, UTAH, U. S. A.

BRANCH SALES AND SERVICE OFFICES:

NEW YORK, 51-52 SOUTH STREET • CHICAGO, 3319 SOUTH WALLACE STREET
BIRMINGHAM, ALA., 3140 FAYETTE AVE. • DULUTH, MINN., 218 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIF., 637 CEDAR STREET
KELLOGG, IDAHO, 107 DIVISION ST. • LONDON W. 1, ENGLAND, 190 PICCADILLY

IN FRANCE: SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND: EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
IN ITALY: EIMCO ITALIA, S.P.A., MILAN, ITALY

ing 2 percent copper and good pyrite content over an average width of 23 feet.

IDAHO—*Giant Mascot Mines Ltd.* reportedly has signed a contract with *Bunker Hill & Sullivan Mining and Concentrating Company* to sell all of Mascot's lead concentrates for the year (starting November 1, 1952) to Bunker Hill. The first shipment has already been made to Bunker Hill's smelter at Kellogg, Idaho. Giant Mascot operates a mine and mill at Spillimacheen, British Columbia. Its mill capacity has been increased to 500 tons daily since last summer, and they have recently treated as high as 13,400 tons in a month.

QUEBEC—*Dominion Asbestos Mines Ltd.* has begun construction of a 2,200-ton mill and it is expected to be in production by March 1953. The property is located in Ham Township, 12 miles east of Asbestos, Quebec.

ONTARIO—The *International Nickel Mining Company of Canada, Ltd.* set off the largest single blast in its underground mining program at the *Frood-Stobie* mine near Copper Cliff. Two giant blocks containing 400,000 tons of nickel-copper ore were broken by the blast which required 64 tons of explosives. Drilling of the 2,000 blast holes totaled more than 31 miles in length.

BRITISH COLUMBIA—*Silver Ridge Mining Company* has suspended mining operations at its *Wonderful* mine in the Slocan district and will concentrate on development work until the price of base metals improves. The company has been mining the Wonderful vein on the No. 3 level and from a raise above that level. This raise will now be continued about 40 feet to connect with the No. 2 level. Work will then be confined to crosscutting on the No. 4 level which has already been advanced over 500 feet.

WISCONSIN—The *Dodgeville Mining Company* is said to have opened a new mine on the Mansfield Richards farm near Mineral Point, Wisconsin. The company reportedly test drilled the area for two months, sinking about 100 holes and finding good bodies of mixed lead and zinc ore. An inclined shaft is being sunk in order that trucks can haul ore and rock directly to the crusher and mill in Dodgeville. The *Girman Mining Company* is reportedly also sinking an inclined shaft a mile away, and the *S. H. & D. Company* is said to be sinking a vertical shaft on another farm in the vicinity.

BRITISH COLUMBIA—*Violamac Mines* will close down its small mill and begin shipping its ore to the *Western Exploration Company's* mill about nine miles away. The company expects to be able to triple present production by this arrangement.

ONTARIO—A uranium strike of "more than passing interest" has been made on a group of islands in northwestern Ontario known as the Manitou Islands. Samples tested after several months of surveying by Geiger counter are said to have run as high as 0.11 percent uranium.

NORTHERN TERRITORIES—*Salmita Consolidated Mines Ltd.* reports satisfactory progress in the winterizing program it is conducting at its Matthews Lake gold-tungsten property. The power house and mill buildings have been completed, and the Diesel plant is well underway. The shaft has been enlarged by the addition of a third compartment down to the 125-foot level in the form

of a separate manway on a system similar to that used by *Eldorado Mining & Refining (1944) Limited*. The original two compartments will carry the two skip cages operated by the new electric hoist. The shaft is to be deepened to 330 feet to open a second development level at 300 feet. All future shaft sinking is to be on a three-compartment basis, carried down as one unit to all levels below the first.

SASKATCHEWAN—Development at *Pitch-Ore Uranium Mines*, adjoining the southwest boundary of *Eldorado Mining & Refining (1944) Limited* in the Beaverlodge Lake area, is now to be concentrated on driving an adit to explore the ore structure. A series of 34 closely spaced diamond drill holes were put down this season, following an early exploration, to explore the main fault zone. Some 1,100-foot length of ore structure has been determined, of which in excess of 700 feet can be opened up from the adit now planned. The company's geologist, E. K. Fockler, estimates that not more than 100 feet of crosscutting will be required to reach the zone.

ONTARIO—*Madsen Red Lake Gold Mines Ltd.* reports on decided improvement in the over-all ore situation of its mine at Madsen, Ontario, in view of the excellent diamond drilling results recently obtained. On the 15th level Madsen has been securing high widths of good grade ore. One hole shows 33.9 feet of 0.542 ounce gold plus another 6 feet about 10 feet away running 0.662 ounce gold. This means a combined ore width of almost 40 feet averaging $17 a ton or better. Greater widths of lower values have been disclosed in other sections, and a few other drill holes, yet to be assayed, have shown favorable structures as well.

NORTHWEST TERRITORIES—*American Yellowknife Mines Ltd.* has reported new finds at its Christie Bay uranium property located on the south side of the Great Slave Lake. Two new zones have been located—one zone has been partially trenched and sampled; the other zone has returned some high Geiger and may be an extension of the main No. 1 zone. Camps are being erected and winter preparations made before freeze-up time.

SASKATCHEWAN—*Tazin Mines Ltd.* reports indications of a radioactive zone on its *Jim* claims in the Milliken Lake sector of the Beaverlodge uranium camp. Consulting geologist Garnet C. McCartney has established that the radioactive zone consists of alteration within the granite adjacent and along a contact with two parallel basic mafic-dike like rocks. He reported that the zone bears considerable resemblance to the red carbonate granitic rock which contains the *Gunnar* uranium deposit. The firm reports that four large rock trenches are to be blasted at its *Felix Bay* property to provide a representative sample of the uranium-bearing zone which will then be sent to Ottawa for recovery tests.

BRITISH COLUMBIA—*Western Uranium Cobalt Mines Ltd.* has changed its name to *Western Tungsten Copper Mines Ltd.* because the company has acquired tungsten and copper producing properties in the Hazelton area of British Columbia. The firm operates the *Red Rose* and the *Rocher De Boule* mines. The Red Rose, a tungsten and scheelite producer, is on long-term lease from the *Consolidated Mining & Smelting Company of Canada, Ltd.* on a royalty basis. A new 200-ton mill has been installed at the wholly owned Rocher De Boule which is a copper producer. Changes in the flowsheet have been made to recover a small percentage of tungsten.

LATIN AMERICA

MEXICO—Daily sulphur production at the plant of *Petroleos Mexicanos (Pemex)*, the official oil company, at Poza Rica is now 140 tons, according to Antonio I. Bermudez, Pemex director general. None of this sulphur is being exported at present; all production is being consumed by Mexican industry.

DOMINICAN REPUBLIC—The first iron ore shipment from this country to the United States arrived at Chester, Pennsylvania in November. The *Chester Blast Furnace Company* received 5,450 tons of the ore. Approximately 10,000 tons a month are scheduled for future shipment to steel plants in the U.S. The ore comes from the Hatillo mining area in the central part of the Republic, about 50 miles from water shipping point of Rio Haina on the Caribbean Sea. Estimates of the size of the deposit range between 3,000,000 and 30,000,000 tons, with iron content between 67 and 69 percent.

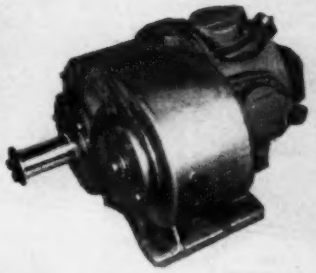
PERU—*Consolidated Guayana Mines, Ltd.*, a subsidiary of *Ventures Limited*, has taken options on the large *Santander* zinc property and the *Aguas Verdes* copper deposit. These, along with several other deposits, are now under investigation by the company. Consolidated reportedly also has an interest in *Chavin Mines Corporation* which owns a rich lead-zinc-copper property in the province of Chincha. Two levels have been opened by adits with a total length of 2,000 feet, and they are now driving along in the vein. A road 85 kilometers long has been completed and shipments of hand-picked ore are now being made by truck.

BRAZIL—*Cia. Vale do Rio Doce* established a new record in August by mining 179,923 tons of iron ore. Total tonnage shipped out through the end of August amounted to 936,556 tons. The company earned $14,610,118 in dollar exchange through the first eight months of the year, almost double its earnings in the same period of 1951. Close attention is being paid to railroad improvements, since a good roadbed is a major requirement for efficient operation of the Rio Doce property. The entire route of the Vitoria-Minas Railway is now expected to be in good working condition by next June.

VENEZUELA—Iron ore production from January through September 1952 totaled 1,455,550 tons, compared with 841,341 tons in the same period of 1951. Of this figure, 1,265,617 tons were exported in 1952, while only 469,668 tons were exported in 1951. However, in 1951, exporting of iron ore did not begin until the last half of the month of March.

MEXICO—Though mining has contributed only two to three percent of Mexico's total annual income during the last few years, the industry provides one-third of the value of the country's exports and from five to ten percent of the government's yearly revenue, according to the Bank of Mexico and the Nacional Financiera, S.A., the government's fiscal agency. The two groups have been

Eimco
Dependable Geared Air Motors



Eimco Geared Air Motors are husky, powerful units built to work on a continuous operating basis with a minimum of attention.

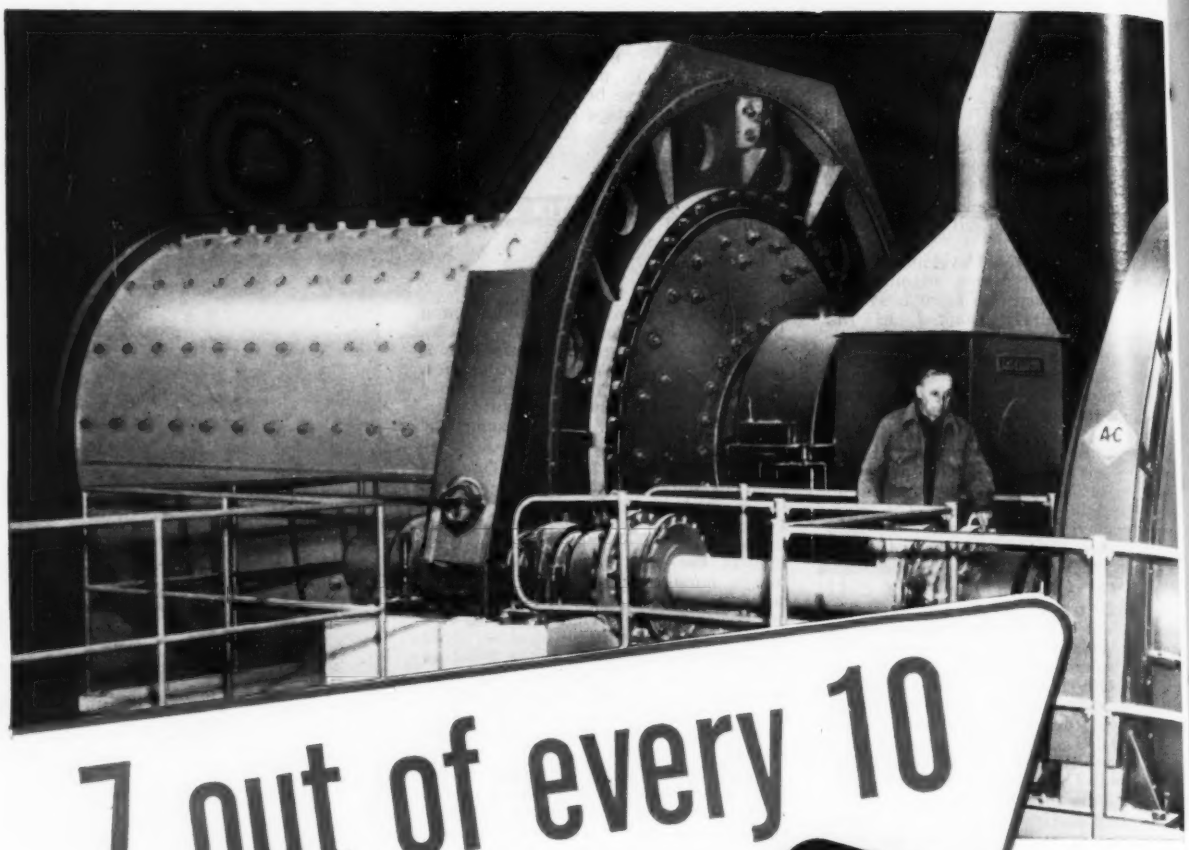
All gearing, shafts and bearings are designed to work under continuous peak loads.

Power units are Eimco 5 cylinder, radial-type, reversible air motors. These motors have a high starting torque and work efficiently on pressures from 40 to 125 p. s. i.

Eimco Geared Units are available in three sizes, conservatively rated at between 7½ to 17 h.p., each with four different speed ratios.

Eimco Geared Air Motors are the only completely safe, completely dependable units.
Write for Bulletin AE6001.

EIMCO A412
THE EIMCO CORPORATION
The World's Largest Manufacturers of Underground Rock Loading Machines
EXECUTIVE OFFICES AND FACTORIES - SALT LAKE CITY 13, UTAH, U. S. A.
BRANCH SALES AND SERVICE OFFICES:
NEW YORK 51 E. 42 SOUTH STREET • CHICAGO 27 S. SOUTH WALLACE STREET
BIRMINGHAM, ALA. 2140 FAYETTE AVE. • DULUTH, MINN. 316 E. SUPERIOR ST.
EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIF. 637 CEDAR STREET
KELLOGG, IDAHO, 307 DIVISION ST. • LONDON W. 1, ENGLAND, 190 PICCADILLY
IN FRANCE: SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND: EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
IN ITALY: EIMCO ITALIA S.P.A., MILAN, ITALY



7 out of every 10

are repeat orders

ALLIS-CHALMERS GRINDING MILLS

OPERATING MEN who have had actual experience with Allis-Chalmers grinding mills will usually specify A-C mills again... as proved by our sales records.

Repeat orders, of course, come only from customers who have been well satisfied. That's why we're proud of the fact that 7 out of 10 new Allis-Chalmers grinding mills go to operators for whom we have supplied mills in the past.

Ask the Allis-Chalmers representative in your area about the many high output and low maintenance advantages of Allis-Chalmers grinding mills. Or write for Grinding Mill Bulletin 07B6718A. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3845

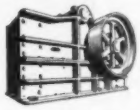
ALLIS-CHALMERS

A-C ALLIS-CHALMERS

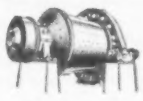
Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Hammermills

Vibrating Screens


Jaw Crushers

Gyratory Crushers


Grinding Mills

Kilns, Coolers, Dryers

surveying Mexican industry from the viewpoint of attracting foreign investments.

PERU—The *Northern Peru Mining & Smelting Company*, a subsidiary of the *American Smelting and Refining Company*, has placed its new 250-ton-per-day concentrator in operation at its *Chilete* lead-zinc property in the Department of Cajamarca. The camp, 750-hp. power plant, and mill were built in ten months at a cost of $2,000,000. Concentrates will be exported through the port of Pacasmayo. Test lots of 10 to 15 tons of ore have been shipped from Toquepala, Northern Peru's porphyry copper deposit in the Department of Moquegua, for concentration tests in the United States.

MEXICO—*Negociacion Minera de Azufre, S.A.* operating in San Rafael and Cerritos in the state of San Luis Potosi, reports that its production of sulphur from January through September 1952 amounted to 8,319 tons. This output is less than a third of the production goal set for 1953, because installation of new equipment designed to increase production had not yet been completed. The company hopes for a monthly production of 2,000 tons in 1953. The sulphur reserve is estimated at 3,000,000 tons of 27.5 to 33.3 percent purity.

BRAZIL—Gold production for the last six years is as follows for Brazil: 1946, 175,000 ounces; 1947, 167,000 ounces; 1948, 157,000 ounces; 1949, 183,000 ounces; 1950, 180,000 ounces; and 1951, 180,000 ounces.

PERU—*Compania Minera La India* which operates a group of gold and silver claims in Nicaragua is now undertaking some exploration work in Peru. Its chief interest is in the *Chapi* copper deposits near Arequipa, Peru. Principal shareholder in La India is *Noranda Mines, Ltd.* of Canada.

MEXICO—Gold and silver deposits are apparently becoming exhausted, reports the Ministry of National Economy. Production of gold decreased 33.4 percent, and that of silver 28.6 percent during the period of 1947 through 1952, as compared with the period of 1941 through 1946. Many deposits of both metals are considered to be on their way out, but the Ministry has found some encouragement in the fact that base metals, in some cases, have tended to offset decreased gold and silver production.

ARGENTINA—In the province of Cordoba, wolframite mining is increasing. Deposits in this area were worked at a maximum during World War II, but in such an irregular manner that no exact knowledge of the reserves is available. One of the most important and best equipped mines is *Cerro Aspero* which produced 360 tons of concentrates between 1940 and 1945. Another large mine is the *San Ignacio* which recovered 146 tons of wolframite concentrates from 1939 to 1945. There are also several promising prospects in the province of Mendoza. The *Josefina* mine near Tunuyan has estimated reserves of 25,000 tons of ore. The average grade is reported to be up to 1.0 percent WO_3. Its total production during the period from 1937 to 1944 was 155 tons of concentrate with an average grade of 65 percent WO_3.

PERU—Many of the mining companies are increasing the capacities of their plants. *Compagnie des Mines de Huaron* is increasing the capacity of its concentrator (which handles copper, lead, and zinc ores) from 750 to 1,500 tons per day. *Sociedad Minera Puquiococha S.A.* has increased its concentrator capacity from 125 to 250 tons per day. *Sindicato Minero Savapullo S.A.* has installed an 800-hp. hydroelectric plant. *Sociedad Minera Yauli* is increasing its concentrator capacity from 150 to 240 tons per day. *Empressa Minera Huamachuco* is increasing its concentrator capacity from 100 to 150 tons per day, and *Compania Minera Millococha* is installing an 80-ton-per-day flotation plant.

COLOMBIA—Colombia is considered in eighth place among the world's producers of gold and first among the South American countries. Over the last six years, her gold output has been as follows: 1946, 437,000 ounces; 1947, 383,000 ounces; 1948, 335,000 ounces; 1949, 359,000; 1950, 379,000; and 1951, 435,000 ounces.

EUROPE

GREAT BRITAIN—*Imperial Chemical Industries* hopes to make titanium on a commercial scale soon. Pilot plants are being built in England, and scientists appear confident that they have discovered new refractories capable of adapting the Kroll process to large-scale production. This will make Britain the third country in the world to undertake production of pure titanium; Canada and the United States are the other two. Since titanium will be a vital metal in Britain's defense program, all details of production are regarded as secret.

CRETE—The iron and manganese mines of Kissamos on the island of Crete have been taken over by an Austrian company for a period of ten years. The deposits, which were found during World War II, offer iron ore with a 50 percent iron content and one to six percent manganese. A few shiploads of ore were recently sent to Austria to check chemical structure and metallurgical reaction.

NORWAY—During October, 80,000 tons of iron ore concentrates were shipped from the *Sydvaranger* mines in Kirkenes. This total was expected to increase to 95,000 tons within the next month. Also during October, about 754,000 tons of iron ore were shipped out through the port of Narvik; in the previous month, 765,000 tons were shipped. The 1952 total is expected to exceed 9,000,000 tons.

ITALY—The first appropriations made by the Italian government for the modernization of the Italian sulphur industry have been granted within the framework of the measures announced almost two years ago and involving a total allocation of 9,000,000,000 lire. Applications submitted by 47 concerns have been accepted, though most of the loans will still be delayed pending submission of all required documents. Meanwhile, the government agency, *Ente Zolif Italiani*, has started research work made possible by the final approval last August of a 950,000,000 lire allocation. Exploration is go-

CHUQUICAMATA SHIPS BLISTER COPPER

The first shipment of blister copper from Chile Exploration Company's new smelter (above) at Chuquicamata, Chile, arrived in New York in December. The blister copper is destined for electrolytic refinement at the Raritan Copper Works of International Smelting and Refining Company in Perth Amboy, New Jersey. Until now, copper production at the Chuquicamata mine had been derived from the oxide type ores which were treated by leaching and electrolyzing. The blister copper is now being produced from sulphide ores. The new sulphide plant, together with the oxide plant which will continue in operation, is expected to attain an ultimate combined capacity of not less than 500,000,000 pounds of copper per year. Chile Exploration and International Smelting are subsidiaries of Anaconda Copper Mining Company.

The AIR HOSE Built to Cut Drilling Costs Three Ways

Use of "MINE KING" Air Hose assures important economies in drilling operations, regardless of conditions.

It's tougher, more durable construction keeps it on the job longer—a saving in hose replacement costs.

Extreme flexibility provides easier handling and facilitates drilling in tight spots and coiling for transport.

Availability in extra long lengths reduces the need for intermediate connections to an absolute minimum—fewer couplings required—less time for setting up the lines.

"Mine King" is a Goodall "Standard of Quality" product, made in sizes ½", ¾" and 1", double and triple cord, maximum lengths of 500 feet.

Contact Our Nearest Branch for Details and Prices

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches: Philadelphia · New York · Boston · Pittsburgh · Chicago · Detroit · St. Paul · Los Angeles
San Francisco · Seattle · Portland · Salt Lake City · Denver · Houston · Distributors in Other Principal Cities
Goodall Rubber Company of Canada, Ltd., Toronto.

Est. 1870

ing on in Sicily and in the Mar[illegible]e-Romagna area of Italy. The *Mon[illegible]catini Company* is also conducting a lar[illegible]-scale research in both places.

FINLAND—The *Harjavalta* [illegible]opper works are expected to begin pr[illegible]ducing iron from copper slag soon. About [illegible]0,000 tons of steel per year are expected to be derived from this iron. In the Ota[illegible]niemi, new plants are expected to produce about 115,000 tons of iron annually.

AUSTRIA—A record output of about 35,000 tons of aluminum was produced last year, against a total of 27,000 tons in 1951. Austrian producers complain of increased competition from other aluminum producing nations, and urge that Austrian exports of aluminum be encouraged by the introduction of tax relief or other methods such as are now in effect in many countries. The domestic price is reportedly still at the comparatively low level of 1,170s per 100 kilos.

WEST GERMANY—A new research center which will engage in chemical, metallurgical, and engineering research is being erected at Frankfurt/Main. To be called the *Batelle Memorial Institute*, it is being established by the research foundation with the same name at Columbus, Ohio. The laboratory will cost about $1,000,000 to build and about $500,000 to equip. Another research center will be established by Batelle at Geneva, Switzerland.

YUGOSLAVIA—A new zinc electrolysis plant with an annual capacity of 12,000 tons is being built in Sabac, Serbia, and should begin producing in 1954. The International Bank has granted a credit of 700,000,000 dinars (about £700,000) for its construction. The new plant will also produce 22,000 tons of sulphuric acid and 40 tons of cadmium.

PORTUGAL—During the first eight months of 1952, the country exported 2,896 tons of wolfram, compared with 2,366 tons in the corresponding period of the previous year. Of this 1952 total, the United States received 1,179 tons; the United Kingdom, 1,168 tons; France, 329 tons; and Western Germany, 196 tons.

ENGLAND—The *Wolfram Prospecting Syndicate*, currently opening up an old mine at Trebartha in Cornwall, has unwatered the underground workings located about 120 feet below the adit. Good values are reported. Some tin and arsenopyrite have been found, along with some wolfram, scheelite, and fluorspar. The Syndicate is associated with the *London & Scandinavian Metallurgical Company* in this venture. On adjoining property, considerable development has been undertaken at the *New Consols* mine. Some lodes have been cut but values are said not to be as good as had been hoped. The prospecting is for wolfram.

RUMANIA—The former Rumanian Ministry for Mining and Chemical Production has been divided into the Ministry of Mining and a new Ministry for Chemical Production. The former Mining and Chemical Minister, Mr. Menescu, has been appointed the new Mining Minister, while the former Deputy Minister, Mr. Florescu, has been made head of the newer agency.

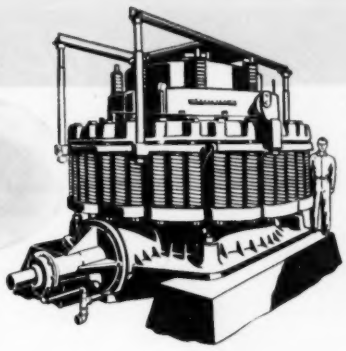
SPAIN—*Minas de Almaden* has raised its quicksilver price from $165 a flask to $180 per flask, f.o.b. Spanish ports. The Spanish price had been reduced earlier this year from $200 to $177 and then to $165. The new price is not a fixed price, says the company, but will serve as a basis for discussion which may vary according to importance and destination of

from the PYRAMID OF KHUFU...

to the MESABI RANGE...

IRON

HAS COME A LONG WAY



THE largest of the *Pyramids of Gizeh* is that of *Khufu,* built of limestone cut in the quarries of the Nile Cliffs and floated across the river to the site of the tomb.

It is claimed by some historians that the oldest iron to be discovered was in the form of a tool found in an air shaft of this great pyramid of Khufu, which was built about 2800 B.C. From Khufu to the modern marvel of the Mesabi Range, iron has come a long way . . . to become the metal of greatest service to man.

Since their introduction, "*SYMONS*" Cone Crushers, with their great capacity for more finely crushed ore at lower cost, have been a big factor in the production of iron ore . . . *and have achieved outstanding performance records in all of the great ore and industrial mineral operations the world over.*

NORDBERG MFG. CO., Milwaukee, Wisconsin

"SYMONS" Cone Crushers . . . *the machines that revolutionized crushing practice* . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

"SYMONS" . . . A NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

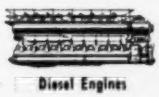
C352

"SYMONS" Primary Crushers

Grinding Mills

Mine Hoists

"SYMONS" Vibrating Bar Grizzlies and Screens



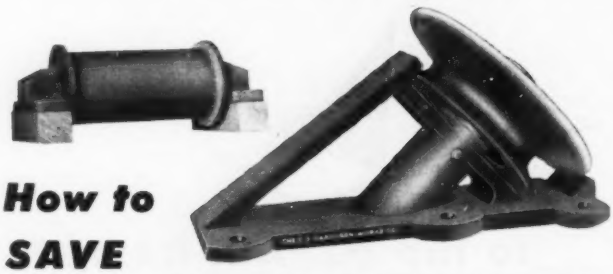
Diesel Engines

NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • SPOKANE • WASHINGTON • TORONTO

MEXICO, D. F. • LONDON • PARIS • JOHANNESBURG



How to SAVE on Your ROPE HAULAGE

Sheaves and rollers definitely affect mine haulage costs. Wearing surfaces must be adequately hardened, with interiors and strength members carefully heat treated for toughness. *Card* sheaves and rollers are made under the same high quality control as *Card* car wheels—first choice for hundreds of cost conscious mines.

C.S. Card Iron Works Co.

2501 WEST 16TH AVE.
DENVER, COLORADO

WORLD WIDE ACCEPTABILITY
GREENSBURG storage battery LOCOMOTIVES are the modern "workhorses" of mining and construction industries in many of the far-flung corners of the world. Users from Hawaii to Honduras, from Algiers to Alabama like their strong, simple construction . . . their extremely low upkeep cost . . . their longer battery life! All locomotives are custom-designed to meet your most exacting requirements. For a more efficient storage battery locomotive use Greensburg. Write TODAY!
HAWAIIAN DREDGING CO.
NO.1
2 TON
GREENSBURG PONY
GREENSBURG MACHINE COMPANY
1090 STANTON ST., GREENSBURG, PA.

an order. The new price is equal to between $190 and $195 in New York.

EAST GERMANY—The Ministry of Mining and Electricity has ordered a search for domestic supplies of copper. Large deposits are expected to be located in the area near Sachsenhausen in the province of Saxony-Anhalt. Upon completion of preparatory work in the spring of 1953, production is scheduled to start on several smaller deposits. Resistance against a new collective contract for work and pay was reported during the later part of September when workers in Saxony-Anhalt were arrested after riots. Employees of the *Calbe Iron Works* at Anhalt, and of the *Henningsdorf Iron Works*, were reportedly imprisoned by the East German Security Police.

ENGLAND—An abandoned mine at Wheal Edward, about one mile from Geevor, has been opened up by Paul Stein as a uranium property. The mine has been known to carry uranium minerals which are not uncommon in the district, and the dumps show considerable radioactivity. After studying old records and checking with a Geiger counter, Mr. Stein decided to reopen the adit. At first, he treated some of the dumps and sold uranium concentrate. In August of last year, he started further underground exploration making counter surveys. A portable compressor was set up, some ore stoped, and the first shipment was made in September.

FINLAND—Surveys conducted by the Geological Research Institute have uncovered two gold-bearing deposits in Finnish Lapland, showing indications of nickel. Samples are being assayed.

YUGOSLAVIA—With the modernization of existing mines and discovery of new deposits, Yugoslavia's bauxite production has increased steadily since the war. It still has not attained pre-war levels, however. Output in 1951 was 453,000 tons or 250,000 tons greater than in 1950, 400,000 tons greater than in 1946, but still 270,000 tons less than in 1939. While bauxite production is on the increase, aluminum production has a long way to go. The goal of 13,000 tons originally set for 1951 under the country's first five-year plan was not reached, and production continues at about 3,000 tons annually.

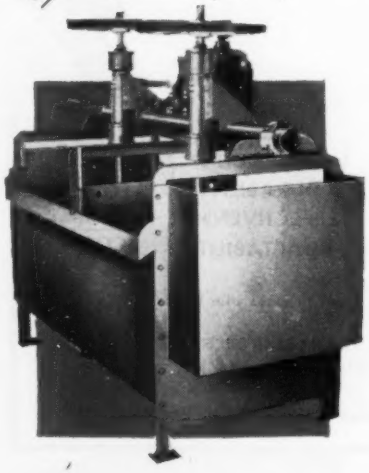
WEST GERMANY—Members of the lead and zinc mining industry are negotiating with the Economics Ministry about reinstatement of the five percent import duties on lead and zinc. Most of the mines are suffering considerably from the decline in lead and zinc prices and some have had to dismiss workers.

BULGARIA—Bulgarian ore mines claim an output of 430 percent more in 1951 than produced in 1948, according to the Bulgarian press. Besides the main district of Pernik, the Perin and Mariza regions are the most important. Soviet machinery was brought into these districts after the abolishing of private ownership in late 1948. The mines are fully nationalized and Soviet engineers are organizing production.

SWEDEN—The *Grangesberg-Oxelosund Mining Company* is planning to build a sponge iron plant with an annual output of 30,000 metric tons, at Oxelosund in northern Sweden. The production is intended for Swedish iron works. Already under construction is another sponge iron plant, this one being built by the *Uddeholm Company*. It will have an annual capacity of 40,000 metric tons, and is being erected at Persberg in the southwestern part of the country.

Lead-zinc cleaning section at one of the largest concentration operations in the world.

Operation AGITAIR



Here, as in many other large plants throughout the world, Agitair is the key to efficient metallurgy.

Its adoption is based on such factors as low cost of operation and maintenance; low power consumption; flexibility and ease of control; minimum wear and tear on mechanism and rubber parts.

The leadership of Agitair in the field of metallurgy has been built on close collaboration among field men, mill men and Galigher engineers.

Write for Bulletin 48 for full data on Agitair and Galigher Ore Testing Service.

Leaders in Experience and Service

HOME OFFICE
545 West 8th South
Salt Lake City, Utah
P. O. Box 209

EASTERN OFFICE
921 Bergen Avenue
Jersey City, New Jersey

Agents In All Principal Foreign Mining Districts

THE GALIGHER CO.

METALLURGICAL DIVISION · THE GALIGHER COMPANY · ENGINEERING SERVICE

CONSULTATION • ORE TESTING
PLANT DESIGN • GEOLOGIC INVESTIGATION

PACIFIC FURNACE

MULTIPLE HEARTH FURNACE

SIZES 8' 6" TO 22' 3" DIAMETER
NUMBER OF HEARTHS, 1-16

ROASTING
CALCINING
DRYING

ZINC ORES	QUICKSILVER
IRON ORES	MAGNESITE
COPPER ORES	LIMESTONE
TIN ORES	MOLYBDENUM
NICKEL ORES	BONE CHAR
LEAD ORES	DIATOMITE
SODA ASHES	LIME SLUDGE
FULLERS EARTH	MAGNESIUM
CARBON	CLAY GRANULES
PYRITE	ANTIMONY

SELENIUM
SEWAGE SLUDGE
LEAD CHEMICALS
METALLIC SLUDGES
FILTERING MEDIA
And for Numerous Other Materials

Pacific Laboratory Furnace

PACIFIC LABORATORY FURNACE

Manufactured in two sizes—36" and 54" inside diameters having 6-8-10 Hearths and include the same features as the commercial size furnace.

Pacific Furnacing Unit

NEW PACIFIC FURNACING UNIT

Higher shell height. Three gas burners. Provision for conversion to muffle unit. Small volume roasts at any desired temperature.

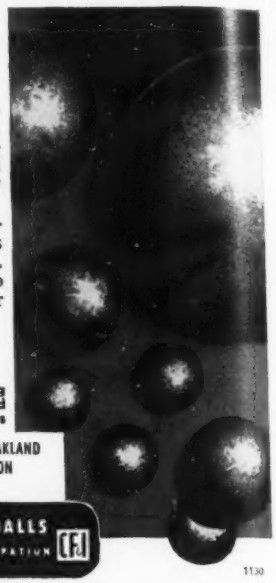
PACIFIC FOUNDRY COMPANY LTD.
Engineers and Metallurgists

1400 So. Alameda St. Los Angeles
3100 19th St. San Francisco
551 Fifth Ave. New York

CF&I STEEL PRODUCTS FOR THE MINING INDUSTRY

FORGED STEEL GRINDING BALLS

Good for the Long Grind



You'll find CF&I Grinding Balls where the going is toughest. They're forged from special analysis steel to give high impact and abrasion resistance...wear evenly and stay spherical.

If you have any grinding problem, call upon CF&I metallurgists and engineers for assistance... they're always available to help you obtain the most from your grinding media.

CF&I PRODUCTS FOR THE MINING INDUSTRY

Cal-Wic Wire Cloth Screens • Grinding Balls • Wickwire Rope • Mine Rails and Accessories • Grinding Rods • Rock Bolts

THE CALIFORNIA WIRE CLOTH CORPORATION • OAKLAND
THE COLORADO FUEL AND IRON CORPORATION
DENVER and NEW YORK

FORGED STEEL GRINDING BALLS
THE COLORADO FUEL AND IRON CORPORATION CF&I

1130

TO MANY A JOB SUPERINTENDENT

PRIMACORD = SAFETY, SIMPLICITY, DURABILITY, EFFECTIVENESS, ADAPTABILITY = LOWEST OVERALL COSTS

* 4 types to meet your needs:

PLAIN, REINFORCED,
WIREBOUND, PLASTIC.

Remember Coast's "SPITTERCORD"

PRIMACORD - BICKFORD
Hot Wire Fuse Lighters
Detonating Fuse
Safety Fuse
Celokap

COAST MANUFACTURING & SUPPLY COMPANY
ESTABLISHED 1867
LIVERMORE, CAL.

Ask your powder supplier or write for literature

COAST MANUFACTURING & SUPPLY CO.
LIVERMORE, CALIFORNIA

OCEANIA

PHILIPPINE ISLANDS—The production of iron ore by companies under the management of *Elizalde & Company, Inc.* totaled 303,394 tons, valued at Pesos 5,194,227.56, for the first six months of 1952. This production came from the *Marinduque Iron Mines Agents, Inc.* at Mogpog on the island of Marinduque, and the *Samar Mining Company* located at Camcueves, General MacArthur, on the Island of Samar. Marinduque mined 97,730 tons during that period, valued at Pesos 1,774,845.84; Samar mined 205,664 tons, valued at Pesos 3,419,381.72. More intensive exploration and development programs are being undertaken by these companies, so greater tonnage is expected in the future. All of this iron ore was shipped to Japan.

AUSTRALIA—*National Minerals, Ltd.* has shipped a $50,000 cargo of rutile and zircon to the United States. The minerals were mined from the black beach sands of New South Wales' western coast, where the company is presently producing an average of 80 tons of rutile per week. Output is expected to be increased to 100 tons weekly in the near future.

NEW GUINEA—*Bulolo Gold Dredging Ltd.* earned an operating profit of $1,710,716 (Canadian) for the year ended May 31, an increase of $510,261. Gold and silver recovered amounted to $2,816,199 (U.S.) against $2,542,400 (Canadian) last year. Gravel reserves are estimated at 80,500,000 cubic yards, which is a drop of 2,500,000 cubic yards from previous estimates.

PHILIPPINE ISLANDS—The *Itogon Mining Company* in the Baguio mining district which late in October had given a 30-day notice of closure will remain open indefinitely. The company had originally planned to discontinue operations after it suffered an "enormous" loss of Pesos 47,398 for the month of October. Inefficiency of laborers, failure of certain equipment, and waste resulting in a considerable drop in output were blamed for the loss. Claude E. Fertig, general superintendent, has taken over the mines department and strenuous efforts have been made to improve the situation. Excessive dilution in the stopes had caused a falling off in grade at the Itogon mine. A high tension electric line is being constructed from the power plant to the portal of the 1300 level, permitting resumption of work which previously had been discontinued because of the burning of a portable generator used to drive ventilating fans. The 23 Sesame Winze continues to be the primary possibility for opening new ore in quantity. Retimbering of this shaft above the water level to 1000 and 1120 levels has been completed.

QUEENSLAND—*Mount Morgan Ltd.* has announced a £A2,000,000 expansion program to be undertaken over the next seven years. Included will be the erection of a £A1,000,000 mill; removal of overburden to open up the Sugarloaf orebodies; £A850,000 for general plant construction; and £A150,000 for full pyrite production.

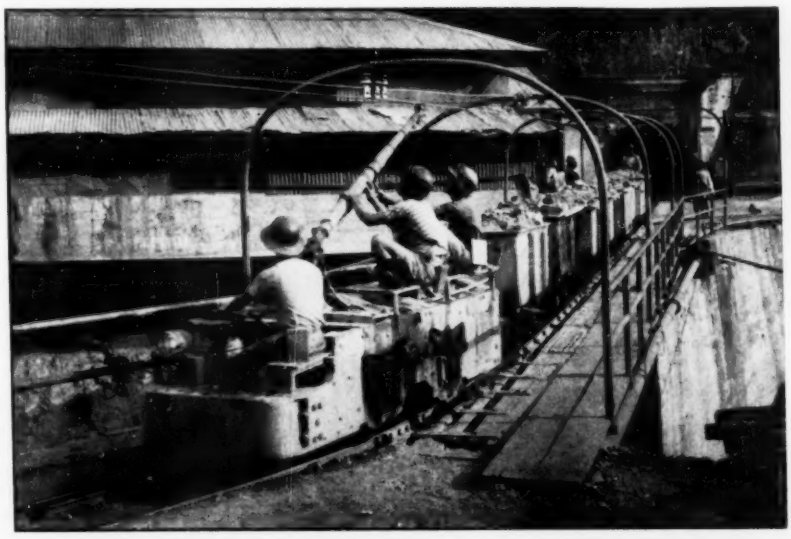
NEW SOUTH WALES—A new company, *Border Tin Company, Ltd.*, will work at Dixon's Gully near Tenterfield. A modern Diesel-powered sluicing plant and rubber-lined pumps are to be installed, along with a 3,000-foot, 10-inch, high-pressure, automatic-ceiling rubber contour pipeline for delivering water to any part of the property. Capacity will be 3,000 cubic yards per week, working one shift only. Tenterfield is in the New England district which, to date, has produced 180,000 tons of tin concentrates. These have come principally from Emmaville and Tingha.

PHILIPPINE ISLANDS—*San Mauricio Mining Company* in the Paracale district of North Camarines, has opened a new section of the Sta. Monica vein, which so far has averaged about 1½ feet in width, by a crosscut from the Sta. Inez adit level. However, vein widths in the Spokane vein development continue to be narrow and are steadily decreasing in the 3993 Winze which is now about 100 feet below the 750 level in Tacoma No. 4 vein. Development continues on the Tacoma No. 3 vein but has not yet opened commercial values.

WESTERN AUSTRALIA—Production has officially started at the *Great Western Consolidated N.L.* The mine is the newest project of *Western Mining Corporation, Ltd.*, and is said to represent the largest mining development since *Big Bell Mines, Ltd.* began operations in the Murchison district. The chief mine of Great Western is the *Copperhead* at Bullfinch where the main shaft is down 1,000 feet.

AUSTRALIA—A four-point program has reportedly been adopted by the Commonwealth government to obtain the best possible results in the uranium fields. First, the government plans to turn most of the departmental survey work over to the large private mining companies; it plans to allow discoverers of uranium deposits to peg leases and mine ore in the same way as other minerals, but the uranium ore must be sold to the government. The government also plans to raise the price of uranium ore from its present rate of 17 shillings per pound. Finally, the government plans to recruit experienced geologists from out of the country if necessary, and to continue its large-scale aerial uranium surveys. A government agency is said to have already discovered more uranium deposits in the Northern Territory by using a survey airplane equipped with radioactivity-detecting equipment.

PHILIPPINE ISLANDS—The *Atok-Big Wedge Mining Company* in the Baguio mining district, which recently gave a 30-day notice of closure, will continue its operations for at least two more years after coming to an agreement with its employees. A three-point agreement, retroactive to August 4, 1952 and continuing until December 31, 1954, provides that the company and the labor union will abide by whatever decision may be rendered on two cases pending before the Supreme Court and two other cases pending in the Court of Industrial Relations; that the company, through its general su-



BENGUET'S PHILIPPINE OPERATIONS

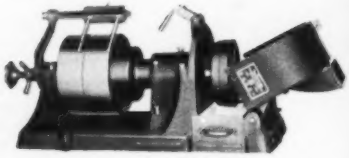
The picture above was taken at the 2,000-foot level of the Balatoc mine, owned and operated by Benguet Consolidated Mining Company near Baguio in the Philippine Islands. The change house may be seen in the background, and the mine portal is to the right. This is the drainage tunnel and haulage level of what was rated as one of the richest gold mines in the world before World War II. Since the war, the grade has been lowered in increasing the tonnage. Recently the 2,400-ton daily rate was increased to 2,800 tons daily, with all of the ore going to the Benguet-Balatoc mill. The company also sends gold from the Antamok mine to this mill. Another of Benguet's properties recently set a new monthly record. Production of refractory-grade, chrome-bearing ore from Benguet's operation of the Consolidated Mines property set a record in October, 1952 of 51,300 tons. This compares with 47,500 tons in September, and 23,000 tons produced in October 1951. The company operates the property for Consolidated on a 50-50 basis.

Reduce Ore to Assaying Size QUICKLY AND EFFICIENTLY

DFC CRUSHERS

Will reduce hard rock 2½ inches in diameter to ¼-inch and finer at the rate of 50 lbs. to 150 lbs. per hour

DFC PULVERIZERS



Will reduce most ore from ¼ mesh to 100 mesh at a rate of about 50 lbs. per hour.

YOUR RELIABLE SOURCE FOR ALL ASSAY EQUIPMENT

The DENVER FIRE CLAY Company

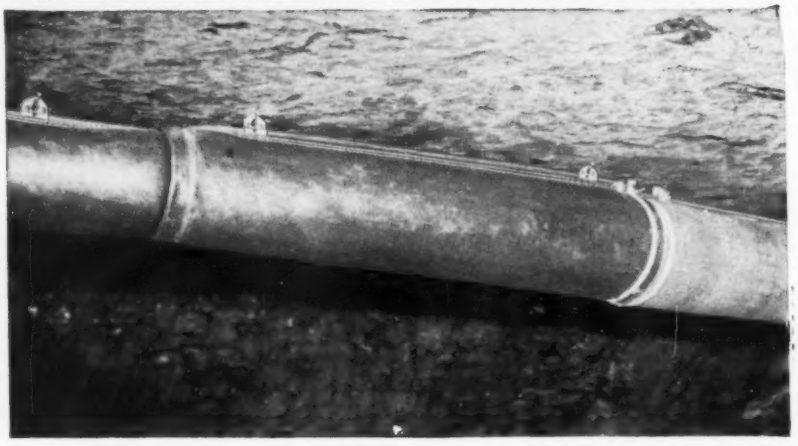
DENVER DFC COLORADO

NEW YORK, N.Y. EL PASO, TEXAS

SALT LAKE CITY, UTAH • BOISE, IDAHO • ALBUQUERQUE, NEW MEX.

WRITE FOR DETAILS AND PRICES TODAY

SPECIFY FLEXIPIPE® the quality ventilating tubing



Flexipipe is now available with Rope Seam Suspension *at no additional cost.* The newest, best, quickest suspension . . . eliminates special accessories and suspension wires . . . *all you need is a nail.* It equalizes strain on the tubing.

Flexipipe is efficient, serviceable, economical. Jute and heavy-duty grades available in a variety of lengths and diameters to meet your requirements.

Write for complete information and sample.

Bemis Bro. Bag Co.

111 No. 4th St., Box 23,

St. Louis 2, Mo.

perintendent, may reorganize its personnel for the purpose of effecting economy and efficiency; and that the facilities presently being extended to the laborers by the company be evaluated at Pesos 1.80 which will constitute part of the wages. The laborers are presently receiving Pesos 2.20; with the inclusion of the Pesos 1.80 evaluated for facilities paid by the company (rice ration, housing, etc.) the wage at Atok will total Pesos 4.00, which is the minimum wage now established by law. The agreement reportedly will assist the company in obtaining a Pesos 3,000,000 loan from the Philippine Reconstruction Finance Corporation to help finance further exploration.

NEW SOUTH WALES—The output of *New Broken Hill Consolidated Ltd.* for four weeks ended October 18 was 20,594 tons of ore. Lead concentrates produced totaled 2,995 tons and zinc concentrates 6,311 tons.

PHILIPPINE ISLANDS—The outlook for the *Hixbar* property at Carogcog on Rapu Rapu island which had been virtually destroyed during World War II has improved considerably during the last six months. *Nielson and Company*, operators of the *Hixbar Gold Mining Company*, report that it may now be a profitable pyrite producer. The mine had been a good copper producer before the war, and had been presumably mined out by the Japanese during their occupation. Ore bodies have been opened up and two ore shipments have been made to Japan totaling 4,572,593 metric tons. A contract has been signed with the *National Power Corporation* for the supply of pyrite ore to the Maria Cristina fertilizer plant at Iligan City, Lanao, for the next ten years. Deliveries begin this month with approximately 12,500 tons of pyrite, and about 25,000 tons will be delivered annually thereafter. For the fiscal year ended July 31, 1952, the company made a net profit of Pesos 11,154.76. Its surplus at the end of that period was Pesos 14,622.79, and gross income was Pesos 30,906.

INDIA—Effective January 1, the *Indian Iron & Steel Company* and the *Corporation of Bengal* have amalgamated. This step paves the way for the granting of a 15 crores loan from the World Bank. The combined units expect to increase their annual production of steel and pig iron from about 300,000 tons and 140,000 tons, respectively, at present, to 700,000 tons and 400,000 tons by 1957.

THAILAND—The *Bangrin Tin Dredging Company, Ltd.* has released its annual production figures for 1951. Operating in western Thailand, output of tin from dredging was maintained at 1,098 tons in 1951, compared with 1,101 tons in 1950. An additional 34 tons were obtained from re-treatment of tailing. This gives a total of 1,132 tons recovered, making 1951 the highest tonnage year for the company since 1937 when 1,164 tons were mined. The increase was obtained because of a higher average value in the ground worked; the No. 2 dredge had not been working since September 1951 when it completed treatment of dredgable ground in the old Bangrin area.

LATE CITY EDITION

THE EV

VOL. CCXII. NO. 58 WEDNESDAY,

EXTRA!

Insulation Stamina

with

ANHYDREX XX

Where your operations demand exceptional resistance to moisture, ozone, heat, and aging, ANHYDREX XX has the extra insulation stamina that means longer-life and trouble-free service. ANHYDREX XX specially compounded insulation will give you uninterrupted service year in and year out at 2,000-17,000 volts in underground, duct, or aerial installations.

Our research engineers aged ANHYDREX XX for sixteen weeks under the grueling temperature of 250°F. (121°C). ANHYDREX XX retained its excellent electrical properties as well as its rubber-like characteristics. We subjected a vegetable oil compound to the same test and after only one week it lost its rubber-like characteristics. A heat-resistant compound had the same result after three weeks of testing. Both compounds became brittle and when bent cracked and crumbled. There is no better proof anywhere that ANHYDREX XX is tops in high voltage insulation.

The next time you need high voltage cables be sure to specify ANHYDREX XX for economy, quality, and satisfaction. ANHYDREX XX Insulated Cables offer the kind of performance that reduces maintenance and replacement costs. For more complete information about what ANHYDREX XX will do for you, contact your nearest Simplex representative or write in care of the address below.

SIMPLEX WIRES & CABLES

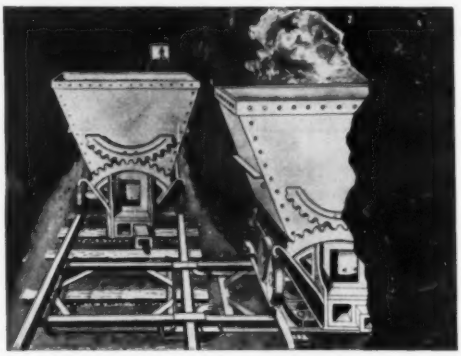
SIMPLEX WIRE & CABLE CO.
79 Sidney Street
CAMBRIDGE 39, MASS.

Ho Ho In

W inves a new the T vesti ment Jamo it p ment FBI Th day (R-I tor form orde leted" case Acc didn back Clar pren T prom perm spect C Ky.) ing men nour inspe men

Le Se Wi

W Lew flan toda a ne out T —hi awai coal woul mand midni Le abou 10-d men and min wag Ind and for t try, these



"Canton" Car Transfer Loads Train of Empties on Single Track . . .

The Canton Car Transfer saves time and money where tunnel space is costly. You are continually loading an empty while transferring the full car to rear. The "Canton" is easiest to use. Timken bearing equipped, sturdy, long-lasting construction.
Canton Car Transfers are made for all track gauges, can be placed on track at any spot where side room permits —in two minutes by two men—built to hold cars up to six tons in weight. Write for complete descriptive folder. In answering please use street and zone numbers.

American Mine Door Company

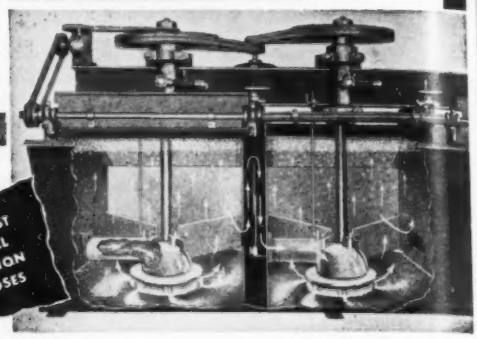
2071 Dueber Ave., Canton 6, Ohio, U.S.A.

Mechanical Track Cleaners—Rock Dusters—Automatic Doors—Car Transfers—Cable Splicers and Vulcanizers—Safety Signal Systems.

Specify . . .

MORSE "Jetair" Flotation

FOR MORE RECOVERY



FOREMOST FOR ALL FLOTATION PURPOSES

- GREATER AIR COVERAGE and INCREASED RECOVERY assured through complete dispersion of air at impeller periphery.
- HIGHER GRADE CONCENTRATE and substantial reduction in reagents.

Supplied with or without individual cell weir controls.

- *Rich Froth Zone.*
- *All Pulp Contacts Each Impeller.*
- *Controlled Air—Through Aeration.*

MB

Write for Bulletin No. 482

MORSE BROS. MACHINERY COMPANY

ESTABLISHED 1898

DENVER, COLORADO, U.S.A. (CABLE MORSE)

One Man Digs and Hauls Big Yardage with a SAUERMAN Drag Scraper

All kinds of long range material handling jobs are accomplished most economically by use of a Sauerman Drag Scraper. You find this versatile one-man machine dragging material out of open pits, cutting down hills, strip mining, cleaning out sludge basins, storing and reclaiming coal, ore and other bulk materials. Wherever used, it saves time, money and manpower.

Above is a typical example of how a Sauerman scraper simplifies a dig-and-haul job. A 400-ft. span machine, powered by a 150-hp. motor, backfills an empty stope at a large nickel mine in Canada. Operated by one man, this scraper scoops gravel and clay from side of a hill and moves the material down to a "raise" at rate of 2,000 tons a day.

If you have a handling problem to solve, write us about it and you will receive, without obligation, suggestions based on our 42 years' experience in furnishing equipment to large and small mining companies, aggregate producers, earthmoving contractors, etc. Also we will send you interesting catalogs.

SAUERMAN BROS. Inc.

538 S. Clinton St., Chicago 7, Ill.

Be a regular subscriber to

MINING WORLD

with which is combined

MINING JOURNAL

The complete American Edition

U.S., North, South and Central American countries—$3.00 per year
All other countries $4.00

SUBSCRIPTIONS IN STERLING

Subscriptions in Sterling are accepted from all Sterling areas if sent to P. J. Sergeant, Mining World, c/o Barclay Bank, 72/73 Cheapside, London E. C. 2.

Includes Annual Mine Development and Directory Number

13 ISSUES

Published at
SAN FRANCISCO, CALIFORNIA U. S. A.

INTERNATIONAL

JAPAN—Terms of the agreement concluded between the *Japan Light Metals Company* and the Canadian concern, *Aluminium Limited*, have now been revealed. Aluminium will buy 50 percent of the Japanese company's stock when that company doubles its capital. The new stock will have a face value of 50 yen, but will be bought by Aluminium at 60 yen per share. The Canadian firm will advance $1,792,000 to the Japanese firm at 5.5 percent interest, with repayment to start three and a half years later. One tenth of the loan will be repaid each half year. Aluminium has also promised not to acquire more than half of the Japanese company and not to inject itself into the policies or management of the latter firm. Aluminium will also offer technical assistance and certain raw materials to Japan Light Metals Company and will receive $12,000 a year for this service. Bauxite may be supplied by Aluminium from its holdings in Malaya.

TURKEY—The *Murgul* copper mine and smelter in eastern Turkey produced 5,300 tons of metal during the first eight months of 1952. Ore reserves are estimated at 16,250,000 tons.

THAILAND—*Takuapa Valley Tin Dredging N.L.* reports that during October heavy rains sank one of its two dredges operating in the Takuapa section of west Thailand.

MALAYA—Proposals have been made to ship part of the slag heaps at the tin smelters in Penang and Singapore to the United States for treatment in the hope of recovering columbite. These heaps have been accumulating for some time, but reliable analysis of the slag has been difficult in that area. United States metallurgists reportedly have examined the dumps and believe that large quantities of the vitally needed columbite could be recovered.

JAPAN—Steel manufacturers in Japan who negotiated a contract with *Chowgule & Company, Ltd.* in Goa (Portugal's possession in India) for the delivery of 500,000 tons of iron ore now expect to wait until March for shipment. There had been hope that deliveries could be made last November, but Portugese colonial officials are said to have delayed the shipments.

AFGHANISTAN—A 100-ton-per-day iron smelting plant has been ordered from Germany by the Industrial Department of the Afghan National Bank. The bank wants to install the plant in Kandus or in Faizabad, where iron ore is now being mined and smelted by obsolete methods.

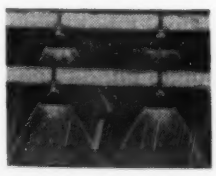
MALAYA—*Pacific Tin Consolidated Corporation* showed a net profit of $1,349,000 for the nine-month period ending last September. In the corresponding period of a year ago, the net profit was only $820,000. Net profit for the quarter ended September 30, 1952 was $459,000 against $266,000 in the same quarter of 1951. During this third quarter, the company sold 1,121,750 pounds of tin, while in the corresponding period of 1951 the sales amounted to 1,080,462 pounds of tin.

THAILAND—Annual production figures for 1951 have been released by the *Siamese Tin Syndicate, Ltd.* Output of tin from dredging operations amounted to 1,564 tons in 1951, compared with 1,525 tons in 1950. An additional 61 tons were recovered from treatment of tailing giving a total production of 1,625 tons, compared with 1,658 tons mined in 1950. The subsidiary company's dredge was out of action for most of the year, but its production loss was offset by the increase achieved by the Peek dredge, and, to a lesser extent, by the Ngow dredges in working richer ground.

INDIA—The gold mines at Hutti in the Raichur district of India have been reopened after a month's shutdown because of labor difficulties.

MALAYA—Reportedly the first company of its kind to be owned exclusively by Malays, the new *Setapak Sharipak Lumbong Ltd.* has been organized to develop tin deposits in the State of Selangor. (Nearly all of the 700 tin-mining enterprises in Malaya are owned and operated by members of non-indigenous races, predominantly British and Chinese.) The new company has many prominent members among its shareholders—the Sultan of Selangor, the Raja of Perlis, and the Yang di-Pertuan Besar of Negri Sembilan. It is said that permission has been granted to dredge a tin-bearing area of about 60 acres at Setapak, 8 miles from Kuala Lumpur, and that the company intends to extend its operations to 500 acres. It is also reported that the company has obtained a permit to prospect 57 acres at Batu Caves which is supposed to be rich in tin.

Concenco Spray Nozzles Simplify Wet Screening



Unique because they are so quick and easy to install, Concenco Spray Nozzles are equally easy to position and align for maximum efficiency. All you do is drill oversize holes, clamp the nozzles on with the gaskets and U bolts provided and you are in business. No threading required. Made in two sizes, for 1" to 2" pipe and for 2" to 4" pipe. Send for descriptive bulletin with operating data.

The DEISTER CONCENTRATOR CO. 925 Glasgow Ave., Fort Wayne, Indiana

WORLD MINING

Issued as an International Department of MINING WORLD

Publishing Office
Emmett St., Bristol, Conn.

Editorial & Executive Office
121 Second St., San Francisco 5, Cal.

A Miller Freeman Publication

Publisher . . . . . W. B. FREEMAN
General Manager . . M. F. HOLSINGER
Editor . . . G. O. ARGALL, JR., E. M.
Production Manager . . J. M. STALUN
Eastern Manager . . . K. WEGKAMP
Field Editor . . . . . R. L. BURNS
News Bureau . . . . . J. M. TAYLOR

Regular correspondents in the following cities and mining centers:

Africa: Accra, Gold Coast; Costermansville, Belgian Congo; Johannesburg, Union of South Africa; and Kitwe, Northern Rhodesia. **Asia:** Ankara, Turkey; Sijua, Bihar, India; Kuala Lumpur, Federated Malay States; and Tokyo, Japan. **Europe:** Frankfurt, West Germany; Helsinki, Finland; London, England; Madrid, Spain; Paris, France; Redruth, Cornwall; Rome, Italy; Stockholm, Sweden; The Hague, Netherlands; and Trondheim, Norway. **North and Central America:** Mexico City, Mexico; San Jose, Costa Rica; and Vancouver, British Columbia. **Oceania:** Port Kembla, (N.S.W.) Australia, Baguio, Philippine Islands. **South America:** Bernal, Argentina; La Paz, Bolivia; Lima, Peru; and Sao Paulo, Brazil.

WORLD MINING is published the 26th of each month as a regular department of MINING WORLD and is also circulated as a separate section on a carefully controlled free basis to a selected list of management and supervisory personnel associated with active mining enterprises throughout the world.

WORLDWIDE PROFESSIONAL DIRECTORY

AGENCE MINIERE & MARITIME S. A.
2 rue Van Bree, Antwerp, Belgium
Sworn weighers, samplers, assayers of ores, metals. Agents for shippers to European ports, plants. Market surveyors, commercial advisers, assuring sales direct to consumers.

BEHRE DOLBEAR & COMPANY
Consulting Mining Engineers and Geologists
11 Broadway New York 4, N. Y.

HERBERT BANKS JOHNSON
CONSULTANT
Electrostatic Separation
Process Developments
520 East Ave. Rochester 7, N. Y.

LUNDBERG EXPLORATIONS LIMITED
Consulting Geologists & Geophysicists
Specialty Airborne Electromagnetic,
Radioactive & Magnetic Surveys.
VICTORY BUILDING, TORONTO

JOHN F. MEISSNER ENGINEERS, INC.
Consulting Engineers
Conveyor Systems Storage Methods
Crushing Plants Ship Loading Docks
Materials Handling and Processing Plants
308 W. Washington St. Chicago 6, Ill.

MARVIN J. UDY
Inorganic Chemistry Electrochemistry
Electric Furnace Smelting
Process Metallurgy
Ferro-Alloys, Calcium Carbide, Phosphorus
546 Portage Road Telephone 2-6294
NIAGARA FALLS, N. Y.

TAILORED TO FIT YOUR NEEDS...

Smelter bags of tailor-made **FUMEALL** filter fabric are now operating in the bag houses of many of the world's most important smelters. The operating records of **FUMEALL** filter bags show substantial savings over conventional fabrics...often giving as much as four times the service of all-wool bags.

FUMEALL, a combination of virgin wool and Dynel, combines the undisputedly superior filtering qualities of wool with the strength, heat, acid, alkali and moisture-resistance of Dynel.

FUMEALL is tailor-made to the exact porosity and weave which meet your specific requirements . . . **FUMEALL** can be ordered as yardage or as completely fabricated bags of any size and specification.

Please write for additional details and samples of FUMEALL filter fabric for fume, dust or liquid filtration.

INDUSTRIAL FABRICS DIVISION

Portland Woolen Mills, Inc.

P.O. Box 2620 • Portland 3, Oregon, U.S.A.

U.S.A. Metal & Mineral Prices

METALS

DECEMBER 17, 195

COPPER:	Electrolytic. Delivered F.o.b. cars, destination U.S.A.	24.50
	Lake. Delivered, destinations U.S.A.	24.625¢-27.50
	Foreign Copper. New York	36.00-36.50
LEAD:	Common Grade. New York	14.00
	Tri-State Concentrates, jig, flotation 80% lead, per ton	$173.75
ZINC:	Prime Western. East St. Louis	12.50
	Tri-State Concentrate, 60% zinc, per ton	$84.00
ALUMINUM:	Primary 30 pound ingots (99% plus). F.o.b. shipping points	20.00
ANTIMONY:	Lone Star Brand. F.o.b. Laredo, in bulk	35.00
BISMUTH:	(In ton lots) price per pound	$2.25
CADMIUM:	Sticks and bars. 1 to 5 ton lots (Price per pound)	$1.50
COBALT:	97-99%, keg of 550 pounds (Price per pound)	$2.40
MAGNESIUM:	Ingots (99.8%). F.o.b. Freeport, Texas	24.50
MERCURY:	Flasks. Small lots, New York	$211.00-$213.00
NICKEL:	F Ingots (5 pounds). F.o.b. refinery, Port Colburne, Ontario	56.50
TIN:	Grade A Brands. New York (Price per pound)	121.50
TITANIUM:	99.3% + (Price per pound)	$5.00-$7.00
GOLD:	United States Treasury price	$35.00 per ounce
SILVER:	Newly mined domestic. United States Treasury price	90½¢ per ounce
	Foreign. Handy & Harman	83.25¢ per ounce
PLATINUM:		$90.00-$93.00 per ounce

ORES AND CONCENTRATES

BERYLLIUM ORE: 10 to 12% BeO. F.o.b. mine, Colorado ..... $43.00 per unit
Small lot purchases at Custer, S. D., Spruce Pine, N. C., and Franklin N. H. Visual inspection at $400.00 per short ton or by assaying at: 8.0 to 8.9% BeO, $40 per unit; 9.0 to 9.9%, $45; over 10.0% $50.

CHROME ORE: F.o.b. railroad cars eastern seaports. Long tons dry weight.
African (Rhodesian). 48% Cr_2O_3 ..... $45.00-$48.00
African (Transvaal). 48% Cr_2O_3. ..... $34.00-$35.00
Turkish. 48% Cr_2O_3. 3 to 1 chrome-iron ratio ..... $53.00-$54.00
U. S. Government ore purchase depot Grants Pass, Oregon, Base price lumpy ore, $115.00; fines and concentrates $110.00 for 48% Cr_2O_3 and a 3 to 1 chromium-iron ratio. Premiums for higher grade ore and for ratio up to 3.5 to 1. Penalties for grades down to 42% Cr_2O_3.

COLUMBIUM-TANTALUM ORE: At small lot beryl purchase depots. $3.40 per pound contained combined pentoxides in 50% ore.

IRON ORE: Lake Superior. Per gross ton Lower Lake Ports.
Mesabi, Non Bessemer, 51.5% Fe ..... $ 9.05
Mesabi, Bessemer, 51.5% Fe ..... $ 9.20
Old Range, Non Bessemer ..... $ 9.30
Old Range, Bessemer ..... $ 9.45

MANGANESE ORE: Metallurgical grade. 46 to 48% Mn. Long ton unit ... $1.20-$1.22
Chemical grade. 80% MnO_2. Per ton $70.00
U. S. Government ore purchasing depots: Deming, New Mexico; base price $2.30 per long dry ton unit of recoverable manganese less handling and treatment costs. Wenden, Arizona; base price of $8.54 per long dry ton of 15% manganese ore. Butte, Montana; base price of $6.05 per long dry ton of 12% manganese ore. Phillipsburg, Montana; base price of $6.43 per long dry ton unit of 15% manganese ore. Small lot program f.o.b. railroad cars, minimum 40% Mn. Base price (48%) $2.30 per unit with premiums and penalties.

MOLYBDENUM CONCENTRATE: 90% MoS_2. F.o.b. Climax, Colorado. Per pound of contained molybdenum, plus cost of containers $1.00

TUNGSTEN CONCENTRATE: 60% WO_3. Per short ton unit $65.00

URANIUM ORE: Carnotite-Roscoelite. F.o.b. purchase depot plus $0.06 per ton mile ($6.00 maximum), Grand Junction, Rifle, Durango, Naturita, and Uravan Colorado. Salt Lake City, Marysvale, Thompsons, and Monticello, Utah. Shiprock, New Mexico, Edgemont, S. Dakota. Base price for 0.10% ore is $1.50 per pound and up to $3.50 per pound of contained U_3O_8 plus $0.75 per pound for each pound in excess of 4 pounds per short dry ton and an extra allowence of $0.25 per pound for each in excess of 10 pounds. A $0.50 per pound development allowance paid on all ores purchases. At Shiprock all ores with more than 6% lime are penalized for excess lime.

VANADIUM ORE: Carnotite-Roscoelite. V_2O_5 in ratio of more than 10 parts to 1 part of U_3O_8 are generally acceptable at all AEC depots, but excess not paid for at Marysvale, Monticello and Shiprock. . . . Per Pound V_2O_5, $0.31

NON-METALLIC MINERALS

BENTONITE: Minus-200-mesh. F.o.b. Wyoming points. Per ton in carload lots $12.50
Oil Well grade. Packed in 100 pound paper bags $14.00

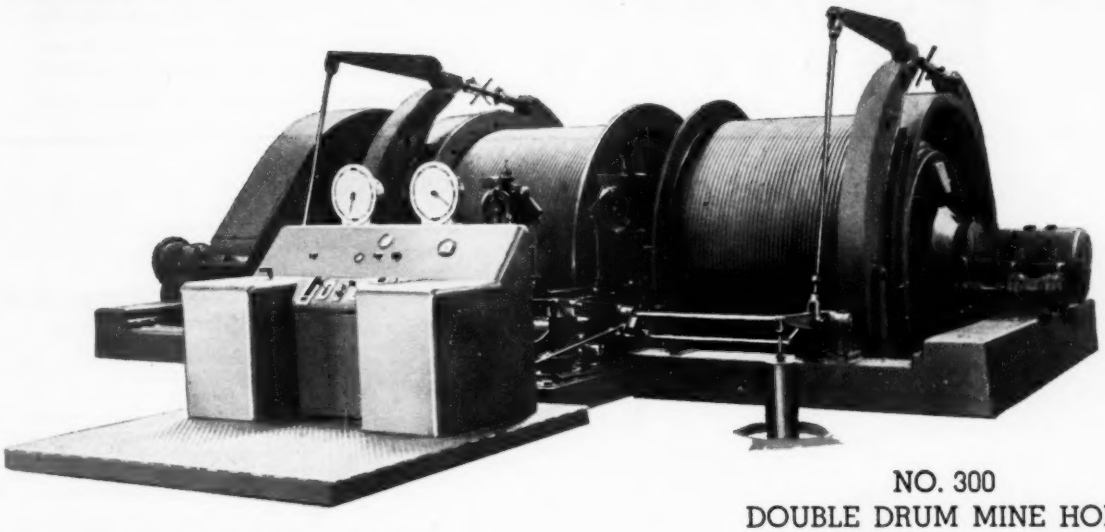
FLUORSPAR: Metallurgical grade. 70% effective CaF_2 content per short ton F.o.b. Illinois-Kentucky mines ..... $42.00-$43.00
Acid grade. 97% CaF_2 ..... $60.00

PERLITE: Crude: F.o.b. mine per short ton ..... $3.00 to $5.00
Plaster grades. Crushed and sized. F.o.b. plants .... $7.00 to $9.00

SULPHUR: Long ton, F.o.b. Gulf Coast mines $22.00

Quotations on metals and certain ores through the courtesy of *American Metal Market*, New York, N.Y.

VULCAN-DENVER



NO. 300
DOUBLE DRUM MINE HOIST

Rope Pull 35,000/20,000 Lbs. Rope Speed 1,125 F.P.M.

Oil operated, radial acting, multiple tooth Dental Clutches
Console mounted Dial Depth Indicators.
Oil operated, gravity acting Post Brakes with torsion spring graduated application.

VULCAN - DENVER HOISTS
IRON WORKS COMPANY COLORADO U.S.A. SINCE 1891 BUILDERS & ENGINEERS

Rebuild that Gyratory Liner . . .

The picture at right shows a 5 foot Mantle Liner which has been coated with a single layer of R.E. About 3/16 of an inch in average thickness.

Mantle or bowl liners of this type if coated with RESISTO-LOY when brand new can be expected to last from 35 to 60 per cent longer. And the cost of the application is very nominal.

Call in our field man. He will show you how to do these jobs in your own plant if you prefer. Welding procedures will be clearly explained so that you can do a satisfactory job.

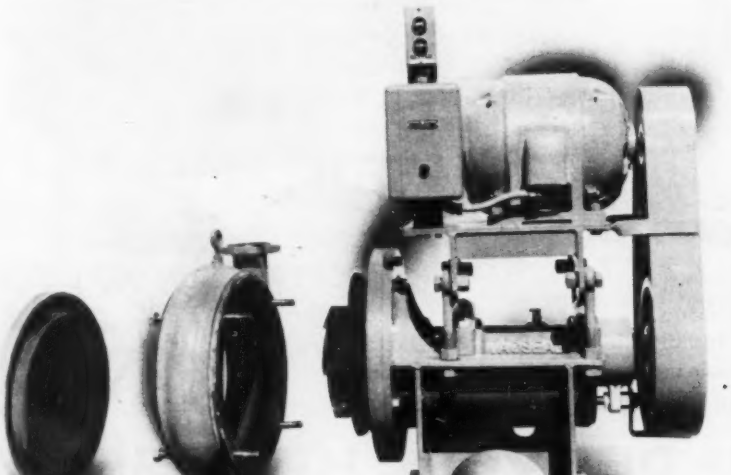
RESISTO-LOY CO.

MANUFACTURER
Grand Rapids 7, Michigan

PRODUCTION EQUIPMENT PREVIEW

PEP is just what new equipment, increased mechanization, and new methods can give to your mine, mill, or smelter. This PEP section is MINING WORLD'S way of making available to you some of the finest current information on mechanization.

SANDS-ACID PUMPS FOR MILL DUTY



The new Vacseal pumps made by the Galigher Company have been engineered specifically for mill and mine duty where corrosive and abrasive acids and sands must be handled. A patented "vacuum-seal" feature prevents fluids and solids from being forced into the gland and produces suction lifts up to 12 feet.

Small auxiliary vanes on the reverse side of the impellar disc produce a vacuum on the shaft seal and prevent particles from cutting the shaft or packing. Lining material—rubber, silicone rubber, or neoprene as desired—is vulcanized to the cast iron parts with a thermosetting cement. This "Vacseal" can be made acidproof by merely changing the gland bushing and installing a shaft sleeve. All of the various models, in sizes from 2 to 8 inches and capacities up to 3,000 gallons per minute, are fitted with heavy shafts and bearings and rugged pumping elements for heavy, continuous duty. A new bulletin giving full details along with operating tables and capacities of Galigher's new pumps will be sent to those circling no. 72.

New Flexible Hose Defies Pressures, Temperatures

A special type of flexible, high-pressure industrial hose has been developed by the Republic Rubber Division of Lee Rubber and Tire Corporation at Youngstown, Ohio. With a mandrel cured, Reprene core reinforced by alternating plies of continuously braided selected textile and standard or extra heavy wire, Wiretex is provided with unusual characteristics of strength, flexibility, oil and abrasion resistance, and an ability to withstand temperature extremes.

Standard sizes ranging from 5/16 inch to 2 inches are built to handle both gases and liquids at working pressures up to 5,500 pounds per square inch and temperatures from (—)40° F. to (+)200° F. Wiretex is also designed to meet high temperature and pressure requirements for steam, air, and ammonia. To get the full details on this new hose, circle no. 70.

Training School Opened For Euclid Servicemen

Special factory training courses in servicing Euclid earthmoving equipment have been opened by the Euclid Road Machinery Company. Courses will be conducted from November to early spring with each course lasting for one week.

Equipment servicemen may choose any of four beginning and four advanced training courses offered. The school is open to representatives of equipment distributors, customers and others that may be interested. Complete enrollment information is available by circling no. 67.

Saran Cable Clamps Will Resist Abrasion, Rust

Holub Industries have come up with a new cable or hose clamp that resists corrosion, abrasion, mild acids, water, oil. It's made of Saran, a thermoplastic that has, as well, excellent electrical and strength properties.

Since these clamps are flexible, they are easily mounted and seldom require lock

washers for secure fastening. Edges are rounded to prevent damage to insulation and coverings. Sizes range from ⅜ inch to 1¼ inches. For further details on this winner—Clamp by Holub out of Saran—circle no. 66.

Job-Site Tire Service Prevents Lost Time

Much of the down-time caused by servicing tires—especially tires carrying off-highway equipment can be saved by a proper, well-equipped, on-the-job program, according to the B. F. Goodrich Company.

A recent release from Goodrich describes the increasing use of the experience-based service offered by Goodrich through its tire dealers. These service programs utilize such equipment as truck-mounted hoists and compressors, pneumatic tools for faster tire removal and replacement, hydraulic jacks, vulcanizers, valve repair tools, and other specialized hand tools. Trained personnel, under the direction of the mine owner or contractor, are available to insure top efficiency and coordination with other job requirements. If you're interested on further details of this maintenance service offered by Goodrich, circle no. 69.

STRIPPING THE EARTH: That's the title of a new booklet published especially for mining men by the Caterpillar Tractor Company. In it are illustrated the many mining uses to which Cat equipment is applicable. For your copy, circle no. 1.

MAN THE PUMPS: To be certain that your pumps are at all times in operating order, get the illustrated, 30-page "Pump Maintenance" issued by Allis-Chalmers. Circle no. 2. A second book in this same series—also Allis-Chalmers—is titled "How and Why of Centrifugal Pumps" and is dedicated to the proposition that in order to use a pump properly, you've got to be smarter than the pump. This book can be had by circling no. 3.

PROTECTED PIT POWER: Westinghouse has published a book that covers the proper use, installation and protection of electric power in open-pit mines from source to ultimate load. Ratings of transformers, shovel performance, power factor correction, and distribution-system layouts for different types of mines are covered in the first part of the book. The second part is devoted to various systems of ground protection, what equipment is necessary in well-designed distribution systems, and where this equipment should be located. Circle no. 4.

ATTENTION MILLMEN: Denver Equipment Company is so confident that the new "Sub-A" Super Rougher flotation machine will lower your tailings losses that they will send you one of the machines to try out in your circuit. If you're not satisfied, just return it without obligation. What more can you ask? If your answer is more information, circle no. 5.

DIESEL ENGINE INFO: Twelve two-page specification sheets have been released by Nordberg describing the one, two, and three-cylinder Nordberg Diesels. These specs include data on optional equipment such as generators and the like. For a full set of the twelve sheets, circle no. 6.

BASIC MILL UNITS: A 16-page booklet published by Pioneer Engineering Works covers the purpose, features, and specifications of Pioneer crushers, feeders, conveyors, vibrating screens, revolving screens, scrubbers, dehydrators, bins and related units that make up crushing, screening, and washing plants. Included are several pages on primary sections—jaw crusher, apron or grizzly feeder, and power unit all mounted on a common set of skids. Circle no. 7.

NEED AIR? Whether its blowers or compressors—either axial or centrifugal—that interest you, Sawyer Bailey Corporation's new bulletin should be in your files. For a copy, circle no. 8.

DIMINUTION: (Seems there ought to be a simpler word that means making little ones out of big ones.) Hardinge has a new booklet out on mills that is backed by forty-six years of successful experience and four thousand installations that are now operating throughout the world. Nuff said. Circle no. 9.

ACID HANDLING A PROBLEM? Hose made from an entirely new compound developed by Hewitt-Robbins' laboratories will handle most acids in concentrations up to 100 percent, sulfuric up to 98 percent, and nitric up to 75 percent. Former hoses were recommended for concentrations from one-half to one-tenth of these figures. To get on H-R's mailing list for literature on this truly acid-proof hose, circle no. 10.

BIG POWER WITH DIESELS: National Supply Company's models 60 and 80 engines range in power from 410 to 1,440 hp. They're designed for standard or super charged, and straight or dual-fuel applications where stationary power is needed. Get bulletin #5201—circle no. 11.

PREVENT LIGHT FAILURES: To guard against production losses caused by sudden lighting failures in mines and mills, install Exide's instantly automatic Lightguards. They immediately floodlight any desired area when normal power sources fail. For more details, circle no. 12.

CUT TIMBERING TIME: The time involved in underground framing—or, for that matter, wherever timber or wood must be cut—can be drastically reduced with Wright power saws. They weigh but 14 pounds and have reciprocating straight blades for fast, fatigue-free operation. Learn the advantages in time and money that these saws afford by circling no. 13.

PUMP BOOK FOR YOUR FILES: Ingersoll-Rand's bulletin on general purpose centrifugal pumps of the cradle-mounted type covers 5 basic groups and 17 corresponding pump types with full engineering and operating data. Get a copy by circling no. 14.

KNOW THE PRINCIPLES BEHIND MATERIALS DRYING? If not, send now for the book offered by Link-Belt. It's designed to illustrate simply and clearly the underlying theories of heat drying bulk materials. A psychometric chart and air and vapor tables are included. Circle no. 15.

SIMPLIFY YOUR HOSE INVENTORIES: Not only has the Thermoid Company reduced their line of molded rubber hose from 18 different types to five basic types, but they've increased the versatility of application. All types are now color-coded for easy identification and offer improved performance through the use of new components. For further details, circle no. 16.

FOR THE POWDER METALLURGISTS: A technical data sheet, "Cyanamid Zinc Stearate U.S.P. As A Lubricant in Powder Metallurgy," has been published by American Cyanamid for instruction in the fabrication of oilless bearings, magnets, and machine parts from powdered metal. Circle no. 17.

POCKET BOOKS FOR ROPE MEN: Two new handbooks for rope men have been published by A. Leschen and Sons Rope Company. The first, book C-51, is titled "Use and Care of Wire Rope" and has 72 illustrated pages covering applications, methods of handling, and engineering data—circle no. 18. The second pocket book, "Wire Rope Handbook R-51," covers the specifications of available types of rope for industrial use. To get the handbook, circle no. 19.

LATEST DOPE ON ROCK MOVERS: Keep your Euclid catalog files up to date by getting the company's revised 16-page folder and data sheet on Euclid Bottom-Dumps and Loaders with latest information and specifications. Circle no. 20.

FOR BETTER MECHANIZED MINING: A new book published by Allis-Chalmers is devoted to the many uses to which A-C equipment has been profitably put in both surface and underground mines. The illustrations and text cover tractors, loaders, graders, bulldozers, winches, etc. To get a copy, circle no. 21.

Circle numbers and mail this card for free product literature

To get further information on any item described in the Production Equipment Preview, note the key number of that item, circle the corresponding number on the PEP card at the right, and mail. If mailed from a point outside the United States, proper postage must be used.

PLEASE PRINT

This card may also be used to subscribe by filling in here

See other side for subscription rates

JANUARY 1953 — **NOT GOOD IF MAILED AFTER MARCH 20**

Circle numbers of items you desire.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80

Also send further free information on the equipment advertised on page:

..... ; Product ..... Manufacturer .....

..... ; Product ..... Manufacturer .....

Name ..... Title .....

Company .....

Address .....

Use this section to subscribe only

☐ New Subscription

☐ Renewal

☐ 1 yr. $3

☐ 2 yr. $5

Name ..... Title .....

Company .....

Address .....

.....

NEED A SMALL SELF-CONTAINED BLOWER? The Jeffrey Aerodyne midget fan will produce 6,200 cubic feet per minute of free delivery air or 5,000 cfm through 2800 feet of 24-inch pipe yet is less than 40 inches in length. Jeffrey's data leaflet on this unit will be sent to those circling no. 22.

AUGERS FOR FASTER DRILLING: McCarthy vertical and horizontal auger drills have increased pit production for many operators. Get information on the advantages these units offer in blast hole drilling and subsoil testing by circling no. 23.

CABLES FOR MINING, the title of a book published by the Simplex Wire and Cable Company, is a comprehensive treatise on the applications and proper installation of electric cables in both underground and open-pit mines. For a copy of this 30-page release, circle no. 24.

SAVE YOUR CONVEYOR BELTS: Two inexpensive but valuable gadgets made by Stephens-Adamson for saving wear and tear on belt installations are described in the S-A bulletin 651. The first is a spring-type, multiple-blade belt cleaner that is easily installed and has no moving parts. The second item is an instant-acting holdback. It works like a hill-holder—stops the belt smoothly and without shock or backward motion, and automatically releases when power is again applied. Circle no. 25.

REDUCE TRACK MAINTENANCE: Track spillage means lost production and expensive maintenance when mucked by hand. Get American Mine Door's 8-page data book on the new Canton track cleaner—this unit automatically cleans both inside and outside the rails and loads the muck in a single operation. Circle no. 26.

PEP'S BLUE RIBBON SPECIAL: One of the most comprehensive engineering books ever published on roller chains and sprockets is the 148-page tome offered by Link-Belt. Anything on the subject not covered here isn't worth knowing. If it's information on roller chains and sprockets you want, get book 2457 by circling no. 27.

THE NEWEST IN SANDS PUMPS: Galigher is now producing a newly designed pump for handling sands and acids in mines and mills. It features protective gland seal and is available in a variety of sizes and capacities. For a bulletin on these pumps, circle no. 28.

WANTA CONVERT A TORQUE? Three new bulletins describe Allison torqumatic converters. They come in three series—400, 600, and 900—for applications in any type of power transmission whether it is off-highway trucks and shovels, crawler tractors, rail use or what have you. For all three of these booklets, circle no. 29.

CONTROL THOSE DUST PROBLEMS: American Wheelabrator & Equipment Company publishes a periodical on dust and fume control called "Dust and Fume Topics." If you want to get on their mailing list, circle no. 30. For a little background on just how Wheelabrator's Dustube collectors are made, applied, and how they work, get the company's publication devoted to mining and metallurgical applications by circling no. 31.

FLUID-COUPLED SHOVELS: A new line of smaller mining and construction shovels is making operating news by their faster, smoother fluid couplings. They're made by Gar Wood who's published a booklet on both truck and crawler-mounted models. Circle no. 32.

KINDERGARTEN TEMPERATURES: Not even a first grade education is needed to tell metal temperatures with Burrell Tempilstiks. They're temperature-marked crayons. Just pick your working temperature, mark the metal with the corresponding crayon and when the mark melts, that's the temperature. A bulletin is available. Circle no. 33.

INTERESTED IN PROFITS? Maybe not, but at any rate Armco has a new booklet published especially for our industry entitled "For More Profitable Mining." It describes the many Armco products designed for use in and around mines. Circle no. 34.

MINERAL INSULATED WIRING: General Cable Corporation has wire that consists of spaced conductors, non-combustible mineral insulation, and a flexible metal covering. No conduits are needed for protection and standard connectors are used. For complete details, circle no. 35.

HARD-FACING GUIDEBOOK: This is the recently revised guidebook originally published by the Stoody Company some years ago. It's a must for any maintenance library now that rebuilding and hard-facing are standard procedures throughout mining and milling. Circle no. 36.

SHOCKING! Where heavy loads are suddenly introduced or removed from operating equipment the resultant shocks can cause tremendous maintenance costs. Dodge Torque-Arm speed reducers and overload releases protect valuable conveyors, motors, v-belts and other transmission devices. To receive Dodge's engineering bulletin A-614-A that has all the necessary details, circle no. 37.

PUMP SELECTOR: A new bulletin, "Nagle Pumps Selector," is published by Nagle Pumps, Inc. to guide you in the proper selection of the company's pumps for even the most abusive uses. Circle no. 38.

MINIATURE SPEED CHANGERS: The perfect solution to fixed ratio gearing problems in instruments, servomechanisms, controls, regulators, or for any low power device can be found in one of the two series of changers made by Metron Instrument Company. For a copy of Metron's bulletin 100—it has all the details—circle no. 39.

LIGHT-WEIGHT PIPE FOR MINING: A new bulletin has been released showing typical applications of Naylor Lockseam Spiralweld pipe in the mining, construction, oil and related industries. For a copy circle no. 41.

CHAMPION OF CRAWLERS: The International TD-24 with its 124 drawbar horsepower is ideally suited for mining and construction work. Colored machine views, action shots, engine views, and specifications are shown in the new information catalog. PEP no. 52.

AIR-COOLED RADIAL COMPRESSORS: Capable of producing 80 to 125 pounds pressure are described in the new Worthington bulletin, PEP no. 53. Pictured and explained are articulated connecting rod, fan cooling of isolated cylinders, forced feed lubrication, and feather valve. Dimensions and weights, capacities, size and cross-section photographs are available for these compressors. Circle no. 53.

For Free Product Literature, see other side

SUBSCRIPTION RATES:

(including the annual Review and Directory)

NORTH, CENTRAL AND SOUTH AMERICA:	one year $3 two years $5
OTHER COUNTRIES:	one year $4 two years $7

SUBSCRIPTIONS IN STERLING one year 28/6 two years 50/	P. J. Sergeant MINING WORLD c/o Barclays Bank 72/73 Cheapside London E.C. 2, England
CANADIAN CURRENCY: one year $3 two years $5	MINING WORLD Royal Bank Bldg., Vancouver, British Columbia, Canada

FOREIGN READERS NOTE:

The copy of World Mining you are receiving consists of carefully selected material from the complete American edition of Mining World to which the above subscription rates apply. If you would like to receive the complete Mining World, fill in the lower section of the reverse side of the card at the left. The card must carry proper postage if mailed from a point outside the United States.

Postage Will Be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT No. 3430, Sec. 34.9, P. L. & R. San Francisco, Calif.

MINING WORLD—WORLD MINING

121 SECOND STREET

SAN FRANCISCO 5,

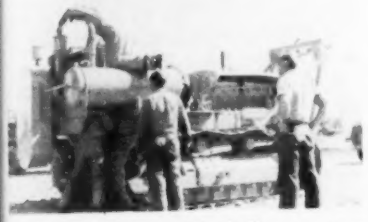
CALIFORNIA,

U. S. A.

Montana Plant Assembles Self-Powered Uni-Drills

The Miller Machinery Company's newly-enlarged plant at Missoula, Montana has been fully equipped to assemble the Worthington-designed Uni-drill. The shops are centrally located to serve the mining districts of Montana, Idaho, and eastern Washington.

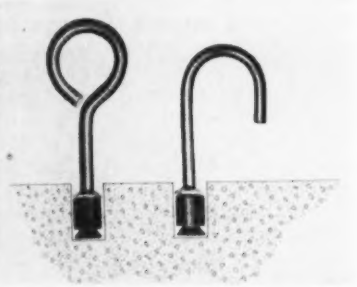
Uni-drill is the name of the self-powered drills that have been designed



for fast, efficient, mobile drilling in mines and on construction jobs wherever permanent air lines are lacking. A compressor, air receiver, water tank, steel and bit racks, and two jumbo-mounted drills are carried on a standard crawler tractor, forming a completely self-sufficient drilling rig. Complete information will be sent those circling no. 78.

Better Rock Anchorage For Rustless Eye-bolts

The latest system of securing pipe hangers and eye-bolts to rock and masonry uses a ribbed steel sleeve and a lead



washer. Repeated blows with a special tamping tool flatten the lead washer and mushroom the sleeve so that the ribs engage the rock surfaces for a tight, permanent fastening.

The Super-Grip Anchor Bolt Company has designed these hangers and bolts to replace pipe straps, anchors, screws, and so forth. The bolts themselves are rust-proofed and can be obtained in lengths up to 6 inches for hole diameters of one-half inch. For further information, circle no. 73.

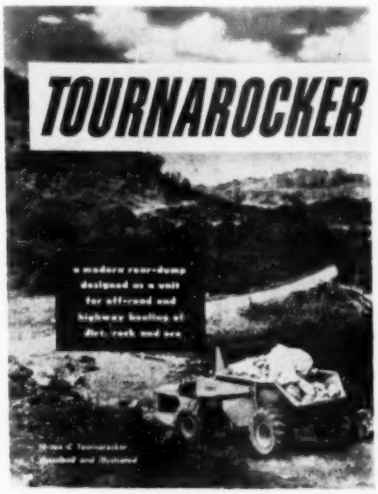
Algebra Used in Weighing Solids in Pumped Fluids

The new device made by the Control Engineering Company weighs flowing fluids whether or not these fluids are homogeneous. The principle behind the meter's operation is not based on pressure, viscosity, or an even density. Therefore, weights of fluids that vary in pulp density can be measured accurately.

Claims by the company state that the unit operates by applying the right algebraic equation. Exactly how this is done is not quite clear but at any rate the fact that it works should be enough to convince mill men of the vital need for such a device. For further information, circle no. 71.

Color Bulletin Describes Rear-Dump Rock Hauling

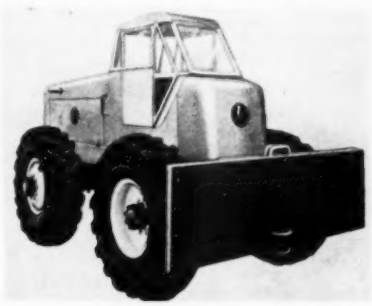
LeTourneau's Tournarockers—maybe you saw the giant 50-ton model at the Metal Show in Denver last fall—are modern rear-dump units designed for off-road rock and ore hauling. A 28-page book describes the many advantages offered by these unique movers.



The fingertip electric control system, 90 degree turning ability, instant shift transmission and torque converter, and big tire features are illustrated in numerous photographs and diagrams. All models—from 9 to 50-ton capacity—have automatic differentials that transfer power to the wheel with traction, safer high-angle dumping between the wheels that gives a lower center of gravity, and smoother shock-free electric body hoist. If you move heavy rock loads, send for a copy of the Tournarocker booklet by circling no. 65.

Four-Wheel Drive On Rubber-Tired Tractor

The latest model of the Payloader, available with either gasoline or Diesel engine, is a heavy-duty unit for drawbar or pusher service. A full reversing trans-



mission provides four gear ratios in both forward and reverse, and speeds up to 27 miles per hour.

Torque converter drive in addition to a friction clutch, rear wheel steer with hydraulic power booster, and big earth-mover tires are features that make the new Payloader especially versatile. Among other duties to which the unit is adaptable, is fast and efficient car spotting—the 16,000 pounds of drawbar pull generated by the Diesel model can move up to 10 loaded freight cars. For further information, circle no. 75.

Crawler-Mounted Dragline Carries 8-yard Bucket

Field tests on Harnischfeger's new dragline, reportedly the biggest ever mounted on two crawlers, have been completed and the model is now in production. Smooth, fast operation is possible on the huge unit because of the Magnetorque controls that are featured. Rotating speeds up to three and one half revolutions per minute can be attained.

The dragline will handle an 8-yard bucket when equipped with a 120-foot

boom or a 7-yard bucket with a 150-foot boom. The hoist line speed is 246 feet per minute and the digging line speed is 199 feet per minute. For complete details on the new machine, circle no. 76.

New Plastic Cells Offer Longer Power Service

A new line of two-cell and three-cell industrial batteries in transparent plastic containers for stationary small power ap-

plications has been announced by the Electric Storage Battery Company.

Known as the Exide-Tytex, type COE, the new cells combine highly sustained useful voltages and long trouble-free life with greatly reduced operating and maintenance costs.

In addition, the batteries offer extreme reliability under all operating conditions, greater output per unit of space, and less weight per ampere-hour output. For a copy of the 8-page descriptive booklet on Exide-Tytex cells, circle no. 68.

NEW
Spiral-Weld
STEEL PIPE

4" to 12" O.D. • 10, 12, 14 Gauge
20' & 40' Lengths • Choice of ends

Can be supplied up to 36" O.D.

HIGH TEST LIGHT WEIGHT
ECONOMICAL LAID COST

For Air, Gas, Oil, Steam, Water Lines

Also { SUPER-RECONDITIONED PIPE, VALVES AND FITTINGS. NEW ALUMINUM PIPE. Complete Fabricating Facilities.

Send specifications for estimate or write for folder

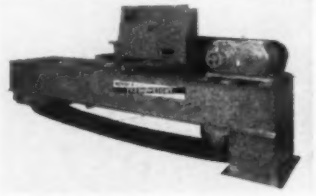
PACIFIC PIPE COMPANY

403 FOLSOM STREET SAN FRANCISCO 5

If it can be made of pipe—We Can Make It

FEEDOWEIGHT

A self-contained conveyor feeder scale that feeds, weighs, totalizes and registers. Use the Feedoweight for better control of ball mill grinding. It accurately controls FEED by WEIGHT, automatically. Made in sizes to meet all tonnage requirements.



MERRICK SCALE MFG. CO.

172 Summer Street

PASSAIC NEW JERSEY

CHANGE OF ADDRESS

CIRCULATION DEPARTMENT
MINING WORLD with which is combined the Mining Journal
121 Second St., San Francisco 5, Calif.

Please change the address of my Mining World subscription.

NAME.....

OLD ADDRESS.....

NEW TITLE OF POSITION.....

NEW ADDRESS.....

NEW COMPANY CONNECTION.....

The Enemy Within The Gates

Christmas morning in the U.S.A.! As we looked down over mile after mile of the sundrenched valley, we felt that it was good to be alive and here. The radio brought the sound of the bells of a great cathedral, calling the faithful to come to give thanks. A turn of a mere spot on the dial brings the voices of a small group who have braved the cold and snow to gather in their mission chapel where they are singing, "Peace On Earth." Turning to the short wave band brings in a voice from an evening meeting in Australia with the greeting, "Goodwill To Men." From across the 3,000-mile long border without a single soldier on guard comes the voices of our Canadian friends, giving thanks for our community of interests and peace. Later there is the voice of a high official in Britain, speaking for the British Commonwealth of Nations, and giving thanks for aims and ideals so like unto our own. Thus was completed the great Freedom Circle clear round the world—a circle which all men of good will may join. Two hundred years ago John Wesley forecast the spirit when he said, "I care not by what name he is known, but if a man loves God and is working for the good of mankind, he is my brother."

"Eternal vigilance is the price of liberty."

We have known of the visits of Duclos of France with the communists here. He was a personal messenger for Stalin. The results of his visits are seen in the changes of Foster to Browder and from Browder back to Foster again in the leadership of the party here. Duclos is now in jail in France charged with being a traitor.

For information we quote Stalin, talking to a delegation of American Communists in Moscow: "For that end the American Communist Party must be improved and Bolshevized. For that end we must work for reestablishment of unity in the Communist Party in America. For that end we must work in order to forge real revolutionary cadres and a real revolutionary leadership of the proletariat, capable of leading the many millions of the American working class toward the revolutionary class struggles. For that end all personal factors and factional considerations must be laid aside and the revolutionary education of the working class of America must be placed above all." William Z. Foster, as head of the Communist Party here, evidently agreed with Stalin for he later said according to the Congressional Record: "The Communist International is a world party, based upon mass parties in the respective countries. It works out its policies by the mass principles of these parties in all its deliberations. . . . The workers of this country and the workers of every country have only one flag and that is the red flag."

The press tells us that the Miners' Union planned a district meeting at Miami, Arizona. It was to have been addressed by Harry Bridges, but the Veterans Organizations objected to the use of the school for the meeting. To avoid disturbance Mr. Bridges found he had a pressing engagement in Hawaii.

The Wanderer.

precipitates—NORTHWEST

Washington Mines Ship High-Grade Manganese

Crescent Mines, a partnership of J. E. Hopper, Mel Lewis, and Sam Marsh of Seattle, Washington, is mining and shipping high-grade manganese ore from two mines on the Olympic Peninsula of Washington. The ore comes from the Littleton Creek mine, and from the Jameson and Peacock workings of the Crescent mine.

During World War II, the Sunshine Mining Company operated the Crescent mine, making substantial production of high-grade manganese ore. Present production is coming from workings above those mined by Sunshine. At the Littleton Creek mine, first shipments of ore mined from an open cut have been trucked over the recently completed mine road to Port Angeles, Washington. Ore from both mines is loaded into railroad cars at Port Angeles and shipped to the U.S. government's manganese ore-buying depot at Deming, New Mexico.

The Littleton Creek mine was discovered by Charles Anderson and Harry Sweeds. They subsequently leased the property to Crescent Mines who built the road in order to transport the ore to market. While first mining will be by open pit, future development will be underground through an adit into the steep hillside.

First production of manganese from the district was in 1924. Shipments to date have been very high grade, many in excess of 53 percent manganese. Hausmannite, $MnMn_2O_4$, is the ore mineral.

Brown's Lake Area To Have New Tungsten Plant

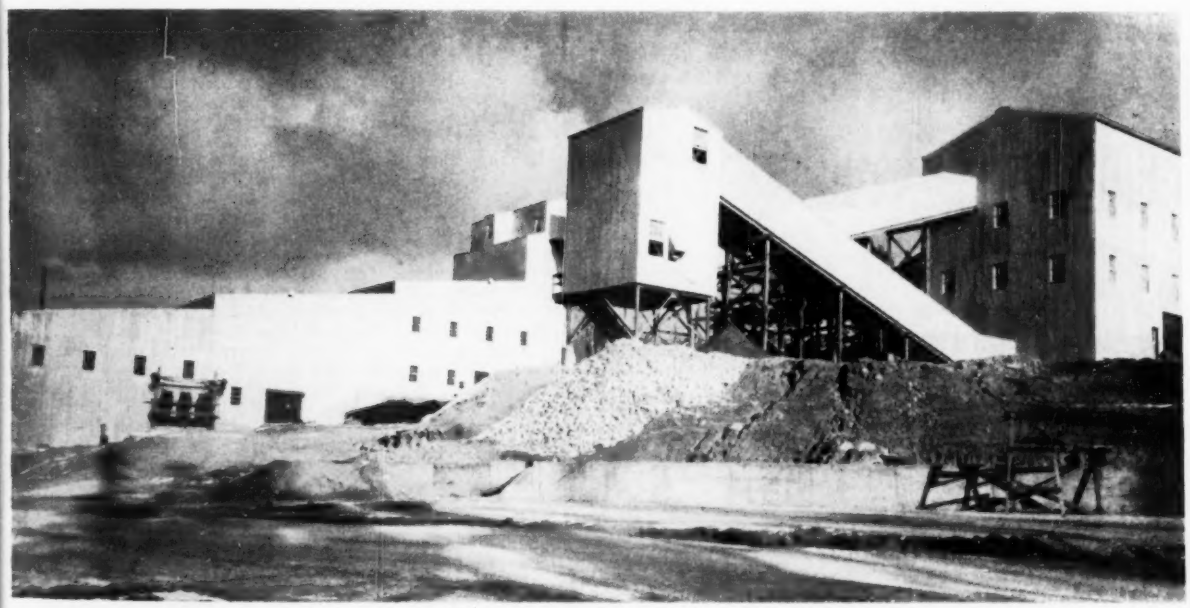
Construction of a flotation concentrator and chemical plant of 400 to 500 tons daily capacity to produce tungsten and molybdenum concentrates is planned for the Brown's Lake tungsten area, Beaverhead County, Montana. Frank Eichelberger, Spokane mining engineer and partner of E. A. Julian of San Francisco in the Brown's Lake tungsten enterprise, said the plant will be built in conjunction with Minerals Engineering Company of Grand Junction, Colorado, which is developing another tungsten property three miles south of the lake.

Expenditure of $200,000 in development work at the Eichelberger-Julian project since June 1951, has indicated tungsten in an orebody about 800 feet long, 150 feet deep and 60 feet thick.

Housing Scheduled For Anaconda Aluminum Plant

Progress toward the 1954 completion of Anaconda Aluminum Company's plant in northwestern Montana includes a recent call for bids on the construction of five homes in Columbia Falls. The twelve sets of plans and specifications sent contractors include a clause demanding that construction be started immediately following the award date, December 15, 1952. The completed homes will house supervisory personnel.

Additional projects to be underway soon include additional land clearance (101 acres of the 750-acre site have been cleared), construction of additional housing, construction of a power line to join the 230,000-volt Bonneville power line from Hungry Horse Dam, and the start of actual plant construction, scheduled for March 1, 1953.



ASARCO STARTS NEW VAN STONE ZINC-LEAD MILL

DIFFERENTIAL FLOTATION MILL of the American Smelting and Refining Company at its Northport Unit (Van Stone mine) in Stevens County, Washington is shown here. This modern 1,000-ton-per-day zinc-lead mill was started October 8, 1952 on a test basis, and since that time has been brought up to capacity operation on a three-shift basis. Ore for the mill is mined under contract from a nearby open pit by the Isbell Construction Company of Reno, Nevada. To the right is the crusher building housing the jaw and cone crushers, and vibrating screen. The belt transfer tower in the front center reverses the flow of crushed ore from the primary crusher to the screen and secondary crusher. Behind the tower is the mill building proper with the 1,000-ton storage bins at the right. Below it progressively are the ball mill-classifier floor; the flotation floor; and the thickener, filter, and concentrate storage floor. Note the absence of windows in the flotation section where interior illumination by fluorescent lights gives a constant uniformity of lighting to facilitate flotation control.

It is not necessary to change your present machine to accomodate our Vibrator Screens. The wedge shape of the screen wire with its non-clogging, non-blinding features permits perfect separation on wet or dry screening. The rigid construction adds considerably to the screens capability and efficiency. Proven in hundreds of installations.

SEND FOR OUR ILLUSTRATED LITERATURE

Wedge-Wire
CORPORATION
5602 CLARK AVE. CLEVELAND 2, OHIO

Tungsten-Mercury
Uranium

find
vital war metals!
with Ultra-Violet
MINERALIGHT

MINERALIGHT instantly identifies tungsten, mercury and many other valuable minerals now in great demand for re-armament.

MINERALIGHT models for every requirement. Money-back guarantee.

ACTUAL ATOMIC BLAST SAMPLE! Send 25c for new mineral specimen from 1st atomic blast at Alamogordo, New Mexico.

FREE! Send for brochure MW "Prospecting for Scheelite (tungsten) with Ultra-Violet."

ULTRA-VIOLET PRODUCTS, INC.
145 Pasadena Ave., South Pasadena, Calif.

IDAHO

The Atlas shaft, near Mullan, Idaho, currently being deepened from the 800 level to a depth of 2,400 feet, has passed the half-way mark, according to R. W. Greenough, president of *Atlas Mining Company*. *Hecla*, *Newmont* and *New Jersey Zinc* mining companies are financing the work.

Monsanto Chemical Company now has its elemental phosphorus plant at Soda Springs, Idaho, in operation and volume production from the electric furnace, one of the largest of its kind, is expected to be reached this month. About 150 people are employed at the plant. John E. Gurvin is plant manager.

Hypotheek Mining and Milling Company has started a 1,000-foot tunneling project at its east side workings in the Pine Creek district of the Coeur d'Alenes. It is the second stage of a $70,000 DMEA contract. The first phase was straightening and enlarging an old 300-foot tunnel and installing heavier rails and a ventilation system.

Bunker Hill and Sullivan Mining and Concentrating Company is reopening its *Crescent* mine, a former silver producer and also a producer of substantial quantities of lead and copper, near the *Sunshine* mine in the Coeur d'Alene mining region of Idaho. At last report, the Hooper Tunnel which is the main entrance to the mine, was being cleaned up and general repairs made. J. B. Haffner, general manager of Bunker Hill, said extent of exploration and development will be determined somewhat by metal market conditions. The mine was closed early in World War II.

Gem State Consolidated Mines, Inc. of Boise, Idaho, reports discovery of a gold, silver, lead, and zinc deposit on the firm's claims near Pearl, Idaho. The ore body was discovered in a crosscut on the Dewey level, 300 feet from the surface. The vein runs from 2 to 3 feet wide. George E. McKenny, mine superintendent, says first assays from the *U. S. Smelting and Refining Company* show 1.9 ounces of gold, 6.5 ounces of silver, 4.3 percent lead, and 5.5 percent zinc.

The *Centennial Development Company* of Eureka, Idaho, is driving a tunnel 3,170 feet long and 7 by 10 feet wide, on patented phosphate claims located 10 miles east of Georgetown, Idaho, under a contract from the *Central Farmers Fertilizer Company* of Chicago. Frank Hennes, mining engineer, is in charge of the work for the fertilizer company, owned by a midwest group. The tunnel will intersect phosphate beds about 900 feet below the surface.

MONTANA

Caledonia Silver-Lead Mining Company of Kellogg, Idaho, is considering construction of a refractory plant to produce a super-clay product from its dickite clay deposits in Fergus County, Montana, officials have reported. Final decision will depend upon additional successful chemical and fusion tests, and operation of a pilot plant.

Irving and Nelson are making regular shipments of high-grade manganese ore (rhodochrosite) from their *Norwich* mine just west of Butte, Montana, to the government's ore-buying depot at Butte. The partners plan to increase production with financing obtained from the GSA as an advance against future production. Contract for the $75,000 advance from GSA was signed early in November. Robert H. Nelson of Helena, Montana, is manager of the underground operations.

Clipper-Bullion Mining Company has been organized by C. W. Thornton of Troy, Montana to operate properties formerly owned by *Morning Glory Mines, Inc.* near Sylvanite, Montana. The property consists of six patented and 26 unpatented claims in the Yakt mining district. It is fully equipped for mining and includes a 100-ton selective-flotation milling plant.

The *Rising Sun Mining Company* of Butte, Montana, was recently incorporated at Helena with a capitalization of $150,000. Directors are Al and Marie Fisher and Ernest Shepherd of Butte, and Dorothy Benson and G. P. Scheibing of Billings.

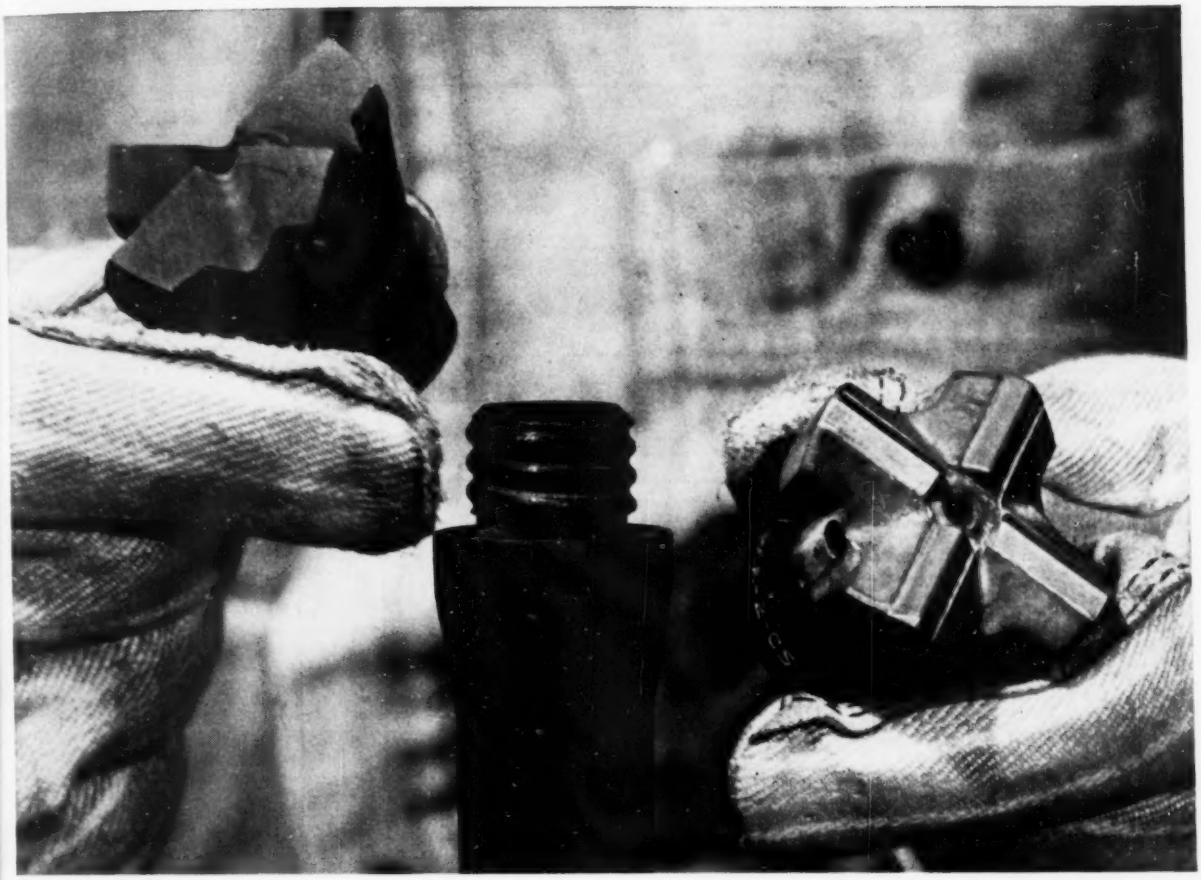
OREGON

The Defense Production Administration has issued a certificate of necessity to the *Hanna Coal and Ore Company*, authorizing fast amortization on $3,566,000. The company has been allowed to write off 85 percent of this amount for the development of a nickel ore mine and its necessary processing facilities on Nickel Mountain in Douglas County, Oregon. The deposit has been known for many years, but metallurgical problems in treating the low-grade nickel ore in which the nickel is found as garnierite (a hydrous magnesium nickel silicate) have heretofore precluded commercial production of nickel from the deposit. Exploration and geologic work in the past by the *U.S. Geological Survey*, the *Freeport Sulphur Company*, and Hanna has indicated several millions of tons containing up to 2 percent nickel to a depth of less than 100 feet on the mountain slope. Construction of an electric furnace would supply ferronickel, which is used in alloying steels.

WASHINGTON

A new surface cut at the Stevens County property of *Columbia Tungsten Corporation* has exposed a 40-foot-wide mineralized zone containing seven wolframite-bearing quartz veins, 4 to 14 inches in width, with high-grade scheelite between the veinlets, reports S. Harry Draper of Spokane, president. The mineralized zone now has been traced 1,500 feet.

NO NEED TO SWITCH STEELS WHEN YOU NEED TO SWITCH BIT TYPES!



Both Timken® bit types fit the same steel!

YOU don't need to switch steels, or stock more than one kind, when you use Timken® interchangeable rock bits. Timken multi-use and carbide insert bits both fit the same threaded drill steel so that you can change quickly to the most economical bit as the ground changes. And you can do it right on the job!

In ordinary ground, when full increments of steel can be drilled, Timken multi-use bits, with correct and controlled reconditioning, will give you the lowest cost per foot of hole.

If you hit hard and abrasive ground, you can switch quickly to Timken carbide insert bits. They're your best bet for maximum speed drilling, constant-gage holes, small diameter blast holes and very deep holes.

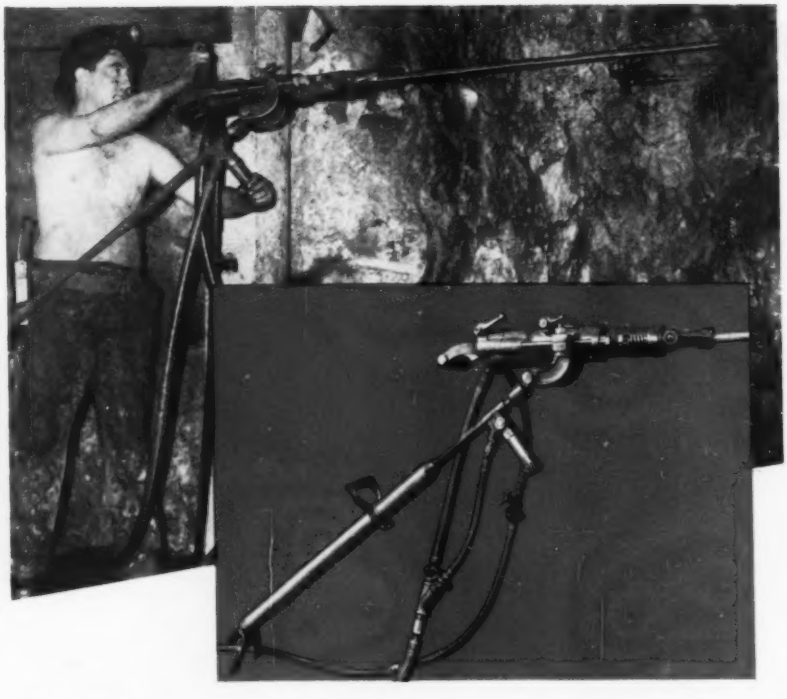
Be sure to have both types of Timken bits on hand and you'll have the best answer to every one of your drilling problems.

Timken multi-use and carbide insert bits are interchangeable in each thread series. And both types have these three important advantages: (1) made from electric furnace Timken fine alloy steel, (2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, (3) quickly and easily changed.

Timken rock bit engineers have 20 years' experience in solving drilling problems. Let them help you select the best bits for *your* job. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN

your best bet for the best bit
. . . for <u>every</u> job



YOU MUST SEE IT TO BELIEVE IT

*Five out of six mine operators buy *COPCO rock drilling equipment when they see it demonstrated.*

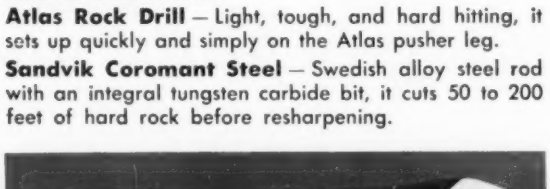
When one man can outdrill two, it's no wonder so many operators are changing over. Every western mining town is buzzing with talk about this new Swedish rock drilling method.

The ***COPCO COMBINATION** is light in weight, but it's rugged and powerful. One miner can set up and drill out easier and faster than two men can use conventional equipment.

***COPCO ROCK DRILLING EQUIPMENT**

Atlas Rock Drill — Light, tough, and hard hitting, it sets up quickly and simply on the Atlas pusher leg.

Sandvik Coromant Steel — Swedish alloy steel rod with an integral tungsten carbide bit, it cuts 50 to 200 feet of hard rock before resharpening.



WRITE FOR FREE DEMONSTRATION AT YOUR PROPERTY

(Presently demonstrations are limited to the western states)

COPCO

COPCO PACIFIC, LTD.
930 Britton Ave., San Carlos, Calif.

COPCO EASTERN, LTD.
151 Linwood Ave., Paterson, N. J.

BRANCH OFFICES AND WAREHOUSES AT SPOKANE · SALT LAKE CITY
DENVER · PHOENIX · JOPLIN, MISSOURI · IRONWOOD, MICHIGAN

Diamond drilling was undertaken recently at the *Old Dominion* mine near Colville, Stevens County, Washington, to determine the extent of a rich shoot of silver-lead-zinc ore opened at the 3,000-foot point in the long-caved main haulage tunnel, according to Earle B. Gibbs of Colville, co-owner with Ira B. Hunley of Spokane.

Dee Chapen, Bob MacDonald and Dave French of Wallace, Idaho, recently started to diamond drill a promising zinc showing near Fruitland in Stevens County, Washington.

Pacific Northwest Mining Company of Bremerton, Washington, has placed the old *Red Top* mine in Stevens County's Northport district in production, and is exploring the adjacent *Lucille* mine. About 20 tons of lead-zinc-silver ore were being trucked daily to the nearby Admiral mill at last report. Expansion plans include stepping up mill production to a three-shift basis, and development of a tungsten-bearing vein, according to Norman O. Lindsley, Colville mining engineer and mine manager. The Red Top is being purchased from *Red Top Mining Company* headed by S. I. Serigstad of Downey, California. The Admiral mill has been leased from *Admiral Consolidated Mining Company* of Spokane. At the Lucille mine, leased from Stephen W. Zoldok, Spokane mining engineer, miners have completed a new 400-foot lower level adit, and are drifting along a limestone-argillite contact which yielded ore in an upper tunnel. Work is under a $37,284 DMEA lead-zinc exploration contract. Martin A. Morrison of Bremerton is president and treasurer of Pacific Northwest; Robert Rukke of Northport is vice president and secretary.

A course in mineral prospecting is being offered by the School of Mineral Engineering, University of Washington, Seattle. Instruction is presented in mineral and rock identification, staking of claims, surveying, discovery and exploration of economic ore deposits carrying uranium, copper, tungsten, and other valuable metals. The term is for the period from January 5 to March 20.

Reports received from prospectors on Washington's Olympic Peninsula have again focused attention on the low-grade manganese deposits there. Charles Anderson and Harry Swedes of Port Angeles have located three claims on Kloshe Nanich Mountain two miles north of the Snider ranger station. According to Anderson, the ore assays about 32 percent manganese. Anderson and associates also have a large group of manganese claims on Aurora Ridge, and at the head of Barnes Creek. He is one of the discoverers of the high-grade *Littleton Creek* mine which is now producing ore.

Ellery Lamb, Seattle mining engineer, and associates reportedly have purchased the *Flag Mountain* group of gold claims from William Ewell, veteran gold miner of the Swauk mining district in Kittitas County, Washington. The new owners plan to start operations immediately, according to Ewell, who reports good recoveries this year from a 10-ton quartz mill. *Nugget Properties, Inc.*, although forced by a water shortage to suspend placer operations early at Liberty in the Swauk district, made "very satisfactory" recoveries, Ewell reported. Another Swauk operator, Clarence Jordan, has been taking out considerable gold from his *Ace of Diamonds* claim on Snowshoe Ridge.

precipitates—CENTRAL and EASTERN

J&L Completes Shaft Sinking at Tracy Mine

Sinking of the main shaft of the Tracy mine of the Jones and Laughlin Steel Corporation's Michigan Steel Division has been completed to a depth of 1,566 feet. Located at Ishpeming, Michigan, this is the newest underground iron mine in operation on the Marquette Range.

Present depth of the shaft provides for four levels at: plus-500, plus-300, plus-100, and minus-100-feet (elevations from sea level). Although the bottom of the main shaft has been concreted, the company plans to sink the shaft further at some future date.

Concrete is being used extensively in this mine. The method of aggregate and cement storage to assure cold season operation is most unusual in that storage and concrete mixing is carried on underground. Concrete is being used for some level bottoms, as well as at the bottom of the shaft's sump in order to facilitate clean-up.

C. H. Frost of Tulsa, Oklahoma, and associates, under the name of *Frojo Mining Company*, are building a 150-ton-per-hour gravity concentration and flotation mill at Neck City, Missouri. Stripping on one of several large low-grade zinc and lead ore bodies is under way. Mining will be by open-pit methods using a model 1201 Lima shovel for loading. Stripping is being contracted locally to the Snyder Construction Company who are using Caterpillar No. 80 scrapers pulled by D-8's. Initial stripping will be about 200,000 yards. Milling practice will follow recent developments in washing and concentration of the low-grade ores containing shale and flint. The mill is estimated to be completed by May 1953. Tom King of Baxter Springs, Kansas, is general manager of the project.

Brown and Root, Inc., contractors of Houston, Texas, are continuing their prospecting program in the Tri-State district. The firm has finished drilling on the E. Z. Wallower farm east of Joplin, Missouri and is now drilling the *Connor* property, also east of Joplin. Good mineralization has been reported as disclosed by the drilling. George Brown, vice president of the firm, was a member of the "Paley Commission."

Potter and Sims have reopened their *Alba* zinc-lead open-pit mine north of Webb City, Missouri and are shipping 1,000 tons of ore per day to their Sucker Flat gravity and differential flotation mill south of Webb City. The Alba pit was closed for several months while test churn drilling was in progress and the waste around the pit's periphery was stripped back to permit deeper mining. About 50,000 tons of waste were removed.

Tri-State production during the month of September has been reported as follows: 426,113 tons of ore were mined, valued at $3.93 per ton, to produce 12,010 tons of zinc concentrates and 2,489 tons of lead concentrates. The tailing retreatment plants remilled 67,520 tons valued at $0.56 per ton. This produced 384 tons of zinc concentrates and 4 tons of lead concentrates.

The Defense Production Administration has issued a certificate of necessity to the *Simpson Coal & Chemical Corporation*, authorizing fast amortization on $468,000. The company has been allowed to write off 75 percent of this amount for the erection of uranium recovery facilities at Caruthersville, Missouri.

A certificate of necessity for accelerated tax amortization has been awarded to the *Brunswick-Balke-Collender Company* of Muskegon, Michigan, for increased production of phosphate rock. The company was eligible for $174,838, with 65 percent certified.

Vanadium Corporation of America has started production of aluminum alloys at its new $2,500,000 plant near Cambridge, Ohio. Located on a 120-acre site about 100 miles from the company's new $8,000,000 alloy producing plant at Graham, West Virginia, the facilities include three low-frequency induction furnaces previously operated at the company's leased plant at Chester, Pennsylvania which has been returned to the federal government. An office building and laboratory are under construction at the Ohio site, and a pilot plant for experimental work in aluminum and alloy metal production is also scheduled to be built.

According to reports from Washington, D.C. the *U.S. Bureau of Mines* has finished its prospecting for manganese in Aroostook County, Maine. Only part of the manganese-bearing formation has been tested in one of the world's most famous potato-growing areas near

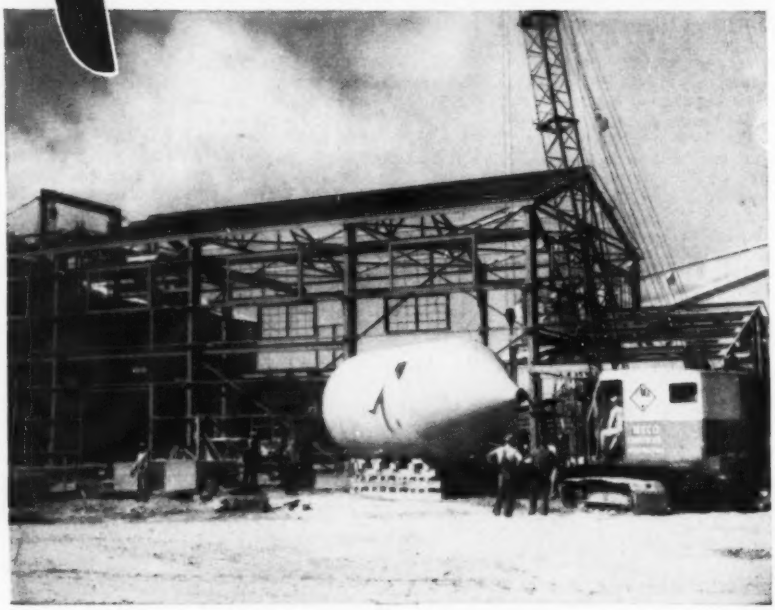
NEW SULPHUR PLANT IN OPERATION

Freeport Sulphur Company's unique floating mining plant is now in operation recovering molten sulphur from beneath Bay Ste. Elaine in the Louisiana marshland. The company expects to recover 100,000 long tons of sulphur per year by this unusual method, adopted because of the prohibitive cost of constructing a permanent installation under the difficult terrain conditions. The plant is designed to use sea water since fresh water is not available. Nearly 2,000,000 gallons of water heated to 325 degrees Fahrenheit are furnished every 24 hours. This superheated water is injected into the salt dome's caprock to melt the sulphur. The aerial view above shows the plant (center) mounted on a 200-foot steel barge, the floating drill rig which reaches down 3,000 feet to the deposit, and insulated tank barges (left) used to transport the molten sulphur to storage 75 miles away. The workers commute by boat to the plant which is only a few miles from the Gulf of Mexico.

ARE YOU PLANNING

★ PLANT ENLARGEMENT?

★ PLANT MODERNIZATION?



The mining industry is faced with (1) increasing demands for special products, (2) changing characteristics of ore bodies. To take full advantage, plants must be enlarged and equipped for new processes—to get more efficient recovery of values and cheaper application of power.

Stearns-Roger offers you 64 years of "know-how" gained thru engineering, designing, and constructing metallurgical, chemical processing, and power plants...together with ample manufacturing facilities for producing much of the special equipment required.

• • • • • • • • • • • • • • • • • •

Stearns-Roger

THE STEARNS-ROGER MFG. CO. DENVER COLORADO

Presque Isle, but this testing has yielded favorable results. To date more than 25,000,000 tons of low-grade manganiferous have been indicated. One report states that the average for that tonnage is 9 percent Mn, but important tonnages of 18 to 25 percent material are available. Also present are about 20 percent Fe_2O_3, 8.46 percent Al_2O_3, 20 percent SiO, and 0.67 percent P. In view of the small amount of high-grade ore mined within the United States, this deposit is believed to offer an important opportunity for steel companies to concentrate low-grade ore to lessen their dependence on foreign manganese sources.

Calumet & Hecla Consolidated Copper Company has changed its name to *Calumet & Hecla, Inc.* Stockholders have approved a proposal to expand the type of business in which the company can engage, and have also given permission to move the head office from Boston if the directors so desire. No move is presently contemplated, however.

IRON RANGES

The Menominee Range iron ore shipping port of Escanaba, Michigan is leading Marquette and Ashland—shipping points for the Marquette and Gogebic Ranges—in tonnage handled for the 1952 season. As of November 1, Escanaba had shipped 4,670,947 tons; Marquette, 3,422,720 tons; and Ashland, 2,452,039 tons. A considerable tonnage of Gogebic Range ore has been railshipped to Escanaba for the last two seasons because of the saving in shipping time over the water shipment.

As of November 24, the Great Lakes bulk freight fleet was only 3,546,80 tons short of its goal of 75,000,00 tons of iron ore moved during the 195 season. It was expected that the goal would be met and possibly surpassed if weather conditions remained favorable for the next few weeks. The season total is only 14,528,052 tons less than the 1951 figure (at this writing) despite the eight-week steel strike and severe storms during the month of October.

Jones & Laughlin Steel Corporation is rushing completion of its new concentration plant near the open pit of the *Hill Annex* mine in northern Minnesota. Equipment in the old washing plant is being dismantled and moved. A large concrete settling basin from which water for the new plant will be reused, is also almost completed. The plant will consist of the concentrator building section; a surge ore storage section; a primary screening and crusher section; a secondary screening section; a desliming classifier section; and a tailing treatment section. It is hoped that the plant will be ready for the opening of the 195 season.

Consumption of Lake Superior iron ore increased almost 390,000 tons during October compared with the previous month. Total consumption in that month was 8,048,031 gross tons. In October of last year, the consumption totaled 7,749,424 tons. Annual consumption through October 1952 was 62,224,22 tons, compared with 74,106111 tons in the corresponding period of last year.

precipitates — SOUTHWEST

New Dry Process For Obtaining Concentrates

A dry electrical process for obtaining potash and phosphate concentrates from the ores in which they are found has been announced by the International Minerals & Chemical Corporation in Carlsbad, New Mexico. The process is said to be more economical than the methods generally employed which require the use of chemical reagents or water.

This new method of refining ore will be known as the LeBaron-Lawver dry beneficiation process, taking the name from the two staff members of the corporation responsible for its development.

In the process, the ore is ground, dried, and given a simple and inexpensive treatment. The fine ore is then passed between electrodes which separate it into the various minerals it may contain.

A large potash-producing unit which will utilize the new process is now being designed, and a new and larger pilot plant will be built immediately at the present Carlsbad Refinery to operate continuously treating semi-commercial quantities of potash by means of the new method. Plans also are now being developed for another shaft and mine for International's unmined orebody in the Carlsbad basin.

Firm Will Develop Low-Cost Manganese Process

The Defense Materials Procurement Agency has negotiated a contract with the Southwestern Engineering Company, Los Angeles, California, to do research on economical methods of extracting manganese from low-grade ores found in Virginia and Arkansas. The "wad" or bog manganese ores are found in substantial amounts in this country, and if a satisfactory process can be developed, the United States would be much less dependent upon imports. (In 1951, 90 percent of the 1,700,000 long tons used were imported.)

The DMPA has agreed to furnish $98,400 for preliminary expenses, plus an additional maximum of $151,600 in operating costs over a period of 18 months, unless terminated earlier by the government.

Three Arizona Mining Companies Consolidate

The Arizona Eastern Fluorspar Corporation has consolidated into one organization three different companies with the same ownership: the Lone Star Mines, Inc., Fluorspar Producers Corporation, and Arizona Eastern Fluorspar Corporation, and now is proceeding with plans for production. Three properties, the Lone Star mine, 15 miles southwest of Benson, Arizona, and the Sydney and Polly Anna, 16 miles north of Duncan, are being operated, and ores from all three will be milled in the same plant.

The company has just completed its mill about 2½ miles northwest of Duncan, on the Gila River at a railroad station called Fox. The plant will have a capacity of 75 tons per day, and will consist of crushers, ball mill, classifier, settling tank, and flotation units. Part of the mill equipment is that which the company acquired by the purchase of an old mill at Lordsburg, New Mexico, but the greater part is new equipment. It is being built on the site of an old mill, which treated fluorspar, lead and zinc at different times many years ago, and parts of the old concrete foundations are being used in construction of the new mill. Ample water for milling operations is obtained from a 54-foot well nearby.

The company expects to haul from 15 to 20 tons daily from the Lone Star, and will mine about 35 to 45 tons daily from the Sydney and Polly Anna mines.

Morris Albertoli is superintendent of mining operations and Cooper Shapley is superintendent of mill construction. The president of the corporation is Leo A. Deatrick of Los Angeles.

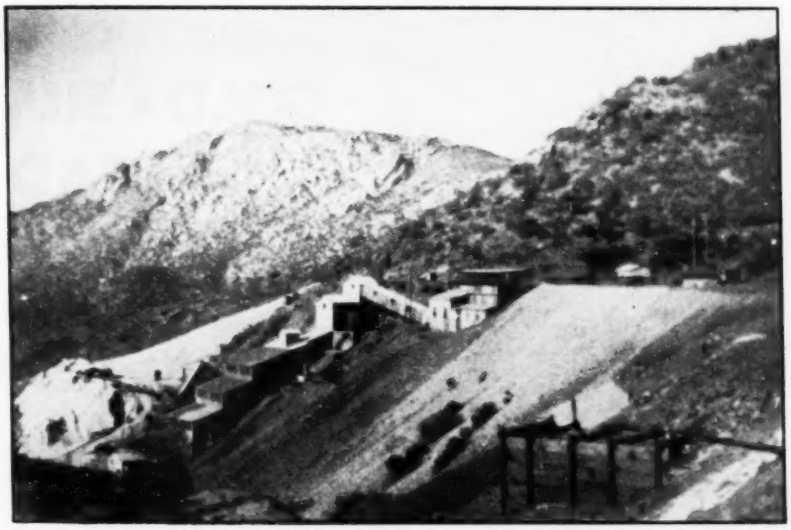
ARIZONA

The *Bear Canyon Mining Company* of Globe, Arizona, has signed a $27,000 contract with the Defense Materials Exploration Administration to explore the lower areas of the lime beds at Bear Canyon for asbestos. D. E. Green is operator of the firm which is now driving 875 feet of drift.

The *U. S. Manganese Corporation* of Phoenix, Arizona, has purchased the *Associated Mining Company's* mill at Aguila, Arizona. The mill has a daily capacity of 150 to 200 tons of copper ore and includes a complete assay laboratory. It will be used to handle low-grade ores from properties controlled by the purchasing concern and will go into operation as soon as adequate labor is obtained. C. D. Brock heads the manganese concern.

The *Bell Asbestos Company* (Keasby-Mathewson and associates) has leased a large group of asbestos claims north of Globe, Arizona, from Wayne Stansbury of Holbrook, Arizona. Asbestos is found in three beds, each up to 20 feet in thickness. The asbestos content is reportedly between 4.0 and 8.0 percent. The Bell company has built 13 miles of road to the claims and is now exploring the beds.

Nash Mines of Austin, Texas, is exploring for lead-zinc-copper ore in Santa Cruz County, Arizona, with the aid of a $38,600 DMEA contract. The government will provide $19,300 of the cost. In Mohave County, Arizona, the *Reed and Reed Mining Company* of Kingman, Arizona is operating under a $20,000 DMEA contract. The government will pay $10,-



ARIZONA'S BORIANA MINE REOPENS

The Boriana tungsten-copper mine (property shown above) has been leased to Dan K. Harper and A. D. Allen of Kingman, Arizona. Harper, who is well known in Arizona, will serve as mine superintendent—a position he held some years ago when the mine was operated by other interests. He has already employed a small crew to reopen the mine and plans to increase the number very shortly. Dye and Bathrick of Kingman, owners of the property, are continuing to operate the mill on dump ore, milling from 30 to 40 tons daily. They expect to mill the mine ore for Allen and Harper when they are in production.

000 of the total cost to explore for lead-zinc-copper.

Concrete foundations for the 7,500-ton copper flotation mill are being poured at the Silver Bell property in Arizona. All excavations at the mill site have been completed and the housing has been finished. *Stearns-Rogers Manufacturing Company* of Denver, Colorado, are building the mill under contract for the *American Smelting and Refining Company*. Stripping of the overburden at the two open-pit copper mines is continuing by the contractor, *Isbell Construction Company*. T. A. Snedden is manager, and Don Purvis, superintendent.

A Defense Production Administration loan of $50,000 has been approved for the *Yucca Mining and Milling Company, Inc.*, of Yucca, Arizona. The money will be used as working capital in the mining of zinc and copper.

The Defense Materials Exploration Administration has signed a $21,000 contract with the mining firm of *Sorenson and Williams* for the exploration of their lease at Salt River Canyon in Arizona. Another small exploration contract has been signed with the *Metate Asbestos Corporation* for a 100-foot crosscut at their *Apache* lease in Arizona.

A discovery of radioactive ore has been reported from the *Detroit* mine, 17 miles north of Kingman, Arizona. The property, owned by I. M. George, is being worked under lease by Adrion Skinner and Dick Hart of Kingman. The partners have been making occasional shipments to mill or smelter during the past two years, the ore carrying values in gold, silver, copper, and zinc. Recently they found that the ore and some wall rock next to the vein are radioactive. The U.S. Atomic Energy Commission has examined, mapped, and sampled the property, and is reported to be ready to finance raising and drifting to further explore the deposit. Mine samples and pulp from carload ore shipments were assayed for uranium oxide and are said to have given very interesting results.

The *Rare Metals* group of 12 unpatented claims, 4 miles west of Kelvin, Arizona, is being reopened by Arnold H. Johnson, Mesa, Arizona. He is constructing a mill for the recovery of molybdenite and expects to have the plant in operation within 60 days. The mill will have a capacity of 50 tons in 24 hours and will consist of a jaw crusher, Hardinge ball mill (50-ton), two Denver flotation units, a classifier and Wilfley table. Underground workings consist of an 85-foot shaft and about 130 feet of drifting and crosscutting from the shaft. The mine was closed down in 1942. Recently, Johnson dewatered the shaft and cleaned out the old workings. When he resumes work in the mine, he expects to sink the shaft to additional depth and then drift and crosscut.

Philip S. Hoyt is going back into the mica buying business and is reopening his mica mill at Aguila, Arizona. He also plans to purchase beryl ores at his Aguila plant. He quotes the current price for beryl—12 percent BeO content—as $500 per ton at Aguila.

The *Arizona Barite Company*, working a group of 12 claims in the Granite Reef mining district east of Mesa, Arizona, is producing at the rate of 300 tons of barite ore monthly. Fourteen men, working on a three-shift basis, are employed in the mine under the direction of Clark Everett, superintendent. William F. Paine of Mesa, Arizona, is company manager.

The *Natomas Company* of Sacramento, California reports that its earnings for the third quarter of this year showed a marked improvement over the earlier periods of the year. The company reported $89,984 net before Federal income taxes, while in the first quarter the company suffered a loss of $15,625, and in the second quarter a gain of only $13,382 in earnings. The improvement was attributed to better operations at the company's *Greenan Placers* property in Lander County, Nevada, where a slide of tailings caused serious structural breakdowns, last year. The operation is now on a profitable basis again and results were expected to be better for the remainder of the year.

The *Cyclone Gap* chrome mine in Del Norte County, California, has produced its limit of 2,000 tons for the Grants Pass (Oregon) stockpile within the short season of four months. The Cyclone Gap

An Unfailing Market for:

GOLD • SILVER • COPPER
LEAD • ZINC

Ores • Concentrates
Bullion • Precipitates
Furnace Products

ASARCO *American Smelting & Refining Co.*

405 Montgomery Street, San Francisco 4, Calif.
700 Pacific Nat'l. Life Bldg., Salt Lake City, Utah
P. O. Box 1111, El Paso, Texas
Tacoma 1, Wash.
607 First National Bank Bldg., Denver 2, Colorado
810 Valley Bank Building, Tucson, Arizona
East Helena, Montana

FOR SCHEDULES, FREIGHT RATES, ETC. WRITE TO YOUR NEAREST OFFICE

underground mine reached by a [illegible]-foot haulage tunnel. Ore is mined from a stope which at present is 70 feet high. M. E. Jacobson is operator of the property.

The *Ubehebe* mine, located in Inyo County, California, is under lease by Louis Hinds, Paul Mix, and associates from the *Ubehebe Lead Mines, Inc.* A new Diesel compressor has just been installed which replaces an old gasoline-driven one. This will enable the lessees to do some effective development work which has been contemplated for some time. The West Drift will be driven ahead, and in a few hundred feet the operators expect to find some ore bodies on the other side of the hill from the tunnel entrance. About 100 tons of shipping ore has been accumulated since the lessees started development work. This ore is to be shipped to a smelter shortly, and the operators hope to be able to make regular shipments from now on.

Guy Richardson of Fresno, California, reports that he is building a new mill at his *Willow Creek* mining property near O'Neals in Madera County, California.

W. A. Fritz has converted his three gasoline-driven engines to propane gas at the *Stockwell* gold mine, four miles from Trona, California. Arrangements have also been made to add a fourth power plant to operate the concentrating table and other milling machinery.

Exploratory drilling has been completed by the *Pinnacles Tungsten Company*, operators of the *Round Valley* mine in the Tungsten Hills near Bishop, California. A scheelite ore body was discovered to be 15 feet thick and proven 30 feet along the strike. The ore body is reported to be 25 feet below and parallel to a 260-foot inclined winze. Cross cutting is now underway from the bottom of the winze to intersect this ore body.

Substantial sulphur mining is reported from the *Canary Hill* mine on Cache Creek near Clearlake Oaks, California. Roads were built to the property last year and equipment installed.

The *Nevada Mining Company* is developing the *Good Kate* and *Amelia* groups, consisting of 21 claims and fractions and two millsites, in the Goldpoint district of Esmeralda County, Nevada. A D-8 bulldozer has cut 15 crosscut trenches a total of 4,800 feet, and has also cleared an access road of three miles. According to John T. Whitaker, president of the firm, 19 veins have been discovered with an average strike length of 3,000 feet and an average width of 16 feet. The scheelite ore assays up to 1.0 percent WO_3. The firm is currently negotiating for the purchase of the *State Line* mill from Charles L. Richards of Reno. Construction of a tungsten recovery plant is also planned.

The *London Extension Mining Company* is currently milling about 430 tons of low-grade gold ore daily at its *Goldacres* property in Lander County, Nevada, 30 miles south of Beowawe. The open pit now is about 1,600 feet long by 900 feet wide, and is more than 220 feet at its greatest depth. The ore is treated in the cyanide mill on the mine site. The company is also conducting metallurgical tests on carbonaceous gold-bearing shale. Harry C. Bishop, manager, is in charge of the operation.

Kaiser Aluminum & Chemical Corporation has been investigating the *Schfabrow-Schendel* group of claims in Black Canyon east of Humboldt, Nevada where fluorspar showings are said to be good.

Allen Russell has leased the turquoise mine owned by George McGinnes and it is being operated for the first time in five years. The property is located between Austin and Grass Valley in Lander County, Nevada.

A 10-stamp mill in Virginia City, Nevada is currently treating gold ore from the *Bald Eagle* mine on the famous Comstock Lode. The mine and mill are owned and operated by the Evans Brothers.

An operating agreement is said to have been signed by officials of the *Magnolia Lead and Oil Company* and the *American-Pacific Oil Company*, whereby Magnolia will operate the *Marigold* gold mine near Valmy, Nevada. American-Pacific, which owns 190,000 shares of Magnolia, will purchase the mine and mill from R. L. Brantley of Medford, Oregon. It will then renovate and complete construction of the 200-ton mill, and will also advance funds for operation until the mine and mill can be self-sufficient. The mine will be worked by open-pit methods. About 400,000 tons of milling ore are said to have been blocked out.

DETACHABLE BITS
HOT MILLING

- We will hot mill, re-temper and harden the popular types and sizes of rock bits.
- We re-shank, re-thread, and re-condition any type, size, or length of Drill Steel.
- We manufacture and maintain a complete stock of new drill rods, gads, chisels, spades, and all other tools used in Pneumatic Paving Breakers or Jack Hammers.

For Rent

Large and small portable air compressors, paving breakers, jack hammers, chipping hammers, pneumatic tools, and air hose.

We specialize in concrete cutting and demolition work.

EMSCO
AIR HOSE COUPLINGS

Dependable, Prompt Service

Phone or write
FOR PRICE SCHEDULES

Emsco Concrete Cutting Company

2751 East Eleventh Street • Los Angeles 23, California

AN 3-4151

A new mill is in operation on the Goodie Ranch, owned by *Graham Development Company*, in Spring Valley, Nevada. A group of six California men are reported to have established the mill to treat custom ore and also ore from the Hub Basin properties which they have also acquired. There is reported to be an abundance of low-grade tungsten in the area. Associated in the venture are Pete Lockhart, Earl Nixon, Curtis Chance, Oliver Ensley, Roger Brubaker, and Al Tannis.

NEW MEXICO

The *Freeport Sulphur Company* is diamond drilling due east of Carlsbad, New Mexico, for potash beds in the Permian basin. This drilling is in Lea County east of the major Eddy County potash mines. Potash beds are much deeper, about 1,700 feet below surface.

The *Skidmore Mining Company* of Dove Creek, Dolores County, Colorado, has leased some uranium mining claims about eight miles north of Grants, New Mexico and west of the Grants-San Mateo road. The company has moved a diamond drill to the claims and has begun test drilling the Morrison formation.

The *International Minerals and Chemical Corporation* is making a study of the deeply buried potash beds in the Permian basin in Lea County, New Mexico, east of the corporation's potash mines in Eddy County. Geological investigations and diamond drilling have disclosed the potash horizon to be at a depth of about 2,000 feet (twice the depth of producing mines). Underground exploration from a deep shaft will be necessary to completely delimit the beds and to determine the economic feasibility of mining this deep potash. George Harley of Carlsbad is International's manager.

The Ground Hog unit of the *American Smelting and Refining Company* at Vanadium, Grant County, New Mexico, has reduced operations to a five-day week because of the decline in base metal prices. W. C. Waidler is superintendent.

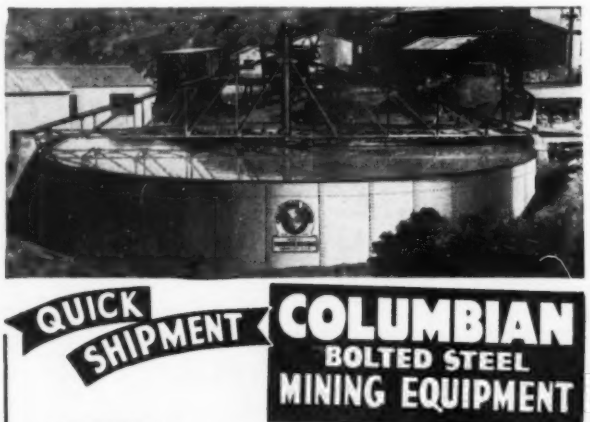
The *Silver Perl* perlite mine near Grants, New Mexico, has been purchased by the *U.S. Gypsum Corporation*. The property covers more than 500 acres, and is considered to be a large and high-grade white pumiceous perlite deposit. Officials of the corporation have been investigating mill site opportunities for the processing plant, and development work is expected to start soon. The property was purchased from A. H. Gunnell, mining engineer, and Dr. F. L. Schneider, both of Albuquerque. Prior to the transaction, the company spent about $25,000 on extensive examination and development work, including diamond drilling and bulldozing to expose the deposits at advantageous points. The Silver Perl property is situated seven miles from Grants in Valencia County, and in the heart of the new uranium district.

Mining operations at the *Kearney* and *Copper Flat* mines of the *Peru Mining Company* in Grant County, New Mexico have been reduced to a five-day week basis because of the low zinc and lead prices. Joseph Taylor is vice president in charge of operations.

At Magdelena, New Mexico, the operating firm of Carl Elayer, Al Jenkins, and Harry Kesey has curtailed operations at the *Lynchberg* mine. The partners lease this lead-zinc mine from the Empire Zinc Division of the New Jersey Zinc Company and have been making ore shipments to the zinc company's flotation mill at Hanover. Mining at Lynchberg is now on a five-day-week basis, according to Elayer.

John A. MacDonald and W. R. Dobson are operating the *Nitt* zinc lead mine at Magdalena, New Mexico. The drop in metal prices has caused them to curtail operations somewhat, but they are continuing to ship ore to the custom section of the *Peru Mining Company's* differential flotation mill just west of Deming, New Mexico.

The *Southwest Potash Corporation*, operating an $11,000,000 mine and refinery about 25 miles from Carlsbad, New Mexico, is now in production after several years of exploration and development work. The new plant is designed for an initial capacity of 3,000 tons of ore per day, and for expansion to double this tonnage when market conditions justify. Southwest is a wholly owned subsidiary of *American Metal Company, Ltd.*



QUICK SHIPMENT

COLUMBIAN BOLTED STEEL MINING EQUIPMENT

AGITATORS • THICKENERS • SOLUTION TANKS • ORE BINS, ETC.

No costly delays. Your order is handled in record time by an expert staff of engineers and designers. Then it is fabricated in one of the best equipped manufacturing plants in the Mid West, with modern presses especially designed for the purpose. Lower your costs with Columbian Mining Equipment for permanent installation, yet portable if change in location is necessary. Standard construction for domestic use or for export by ocean freight. Special if for export via mule-back or airplane to final destination. Order from distributors listed below—or write direct for complete facts.

P. O. Box 4048-H

COLUMBIAN STEEL TANK CO. • Kansas City, Mo.

Distributors in the United States

Denver Equipment Company
1400 Seventeenth Street, Denver, Colorado
Eimco Corporation
34 South 4th West Street, Salt Lake City, Utah

Distributors—Foreign

Avenida Ejercito Nacional 458, D
Colonia Chapultepec Morales
Mexico, D. F.

INDAIR

INDUSTRIAL AIR PRODUCTS CO.

geared to the MINING INDUSTRY for faster, better service on all your WELDING NEEDS!

PORTLAND, OREGON . . MEDFORD, OREGON
SPOKANE, WASH. . . . . YAKIMA, WASH.
PASCAGOULA, MISS. . . NEW ORLEANS, LA.

Idarado Leases Colorado Standard's Mine, Mill

The Idarado Mining Company has taken a lease and option on the lead-zinc mines and 100-ton differential flotation mill of the Colorado Standard Lead Zinc Mines, Inc. on Henson Creek, Hinsdale County, Colorado. Idarado has a large exploration program planned at the Colorado Standard property to further explore the Ute and Ulay veins.

Colorado Standard purchased the property early in March 1951. Since that time, the firm has rehabilitated the mines' underground workings, rebuilt the 100-ton-per-day differential flotation mill, and operated it since April 1952.

Idarado is owned by the Newmont Mining Corporation and the Homestake Mining Company. It has operated the Treasury and Meldrum tunnels, and the Ajax and Black Bear mines in Ouray and San Miguel Counties in Colorado since 1946.

Smelter, Mine Closings Due To Pb-Zn Price Drop

International Smelting and Refining Company will close its Tooele, Utah lead-zinc smelter this month unless sufficient amounts of ore are received from custom shippers to maintain efficient operations.

Frank A. Wardlaw, Jr., general manager, said the plant will not be reopened for three or four months, or "until enough ore can be stockpiled to warrant a reopening." Meanwhile, the company will continue to buy ore as usual.

The possible shutdown is a secondary result of a drop in lead-zinc prices coupled with increasingly high operating expenses, and will affect 500 employees. The plant normally produces 5,000 tons per month of lead bullion and considerably greater amounts of zinc metal. It has been in operation for 42 years.

In Colorado, five companies have been forced to cease operations because of the same unfavorable metals market. The biggest operation to shut down is the Akron unit of the Callahan Zinc-Lead Company at Whitepine, Gunnison County. All production has been completely stopped, and only a skeleton crew will be maintained. The mine and 300-ton differential flotation mill, which had a combined average monthly payroll of $30,000, will remain closed "until metal prices again justify reopening." The Akron unit has been in operation since 1942, and mill operation has been continuous since January 1, 1948. J. E. Dunn, general superintendent, will remain at the mine.

S. E. and Walter Burleson, operators of the Mary Murphy mine near St. Elmo, Chaffee County and the Antoro mine at Bonanza, Saguache County have also stopped production. The Mary Murphy is under a rehabilit tion program at present, although some ore has been shipped for the past four years. The Antoro has been a steady producer since 1948, with mine production averaging approximately 250 tons of lead and 300 tons of zinc, metal content per year. Walter Burleson, one of the co-operators, said that he and his partner will not consider opening the mines until the price of lead reaches 16 cents.

The Knickerbocker mines in Dolores County which include the Badger, Union Carbonate, and Aztec groups plus several miscellaneous claims, have also shut down. Sixty tons of lead-zinc ore per week were produced by the properties, which are owned by K. L. Erickson, N.J. Knickerbocker, and Edward C. Baer. A company spokesman said the shutdown was permanent on the present lead-zinc price.

The Slate River Mining Company's zinc-lead operations near Crested Butte, Gunnison County, have also stopped production.

AEC Settles Dispute Over Uranium-Gas-Oil Leases

The U. S. Atomic Energy Commission recently announced a settlement of the conflict which has arsien between uranium miners and oil and gas interests in the western states, particularly in Utah and Colorado.

A leasing system has been worked out which will allow uranium prospecting and mining to continue, with no substantial changes, in public land areas previously covered by federal oil and gas leases, providing that the mining programs are carried out according to standard mining and labor regulations and providing that the mining operations do not interfere with the lawful operations of oil and gas concerns already working in the same area.

The lease dispute arose when miners were refused locations by government agencies after having been licensed by the AEC to prospect for and mine uranium. AEC officials undertook to straighten out the dispute as part of the government policy of encouraging the search for uranium by private individuals and concerns. They expect to work out similar agreements with the federal agency concerned should disputes arise due to the discovery of uranium on lands withdrawn for location and for other reasons.

Exploration work at the *Carbonero* silver-lead-zinc mine at Old Ophir, Colorado is well underway, and repayment of a recently granted $39,560 Defense Minerals Exploration Administration loan has already begun on a maximum royalty basis. Good ore was almost immediately encountered in the Carbonero vein when exploration work was started according to E. H. Sanders, president of *Silver Bell Mines Company*. Mr. Sanders said that drifting is continuing on the Panama vein, and that stoping of ore in the old sections of the mine is now in progress. Development tonnage from the drifting on the Carbonero and Panama veins goes to the Silver Bell mill to be processed in a zinc flotation section, as does a higher grade lead-silver ore being stoped. In preparation for the $79,120 exploration project, Silver Bell built a road and power line to the Carbonero mine, installed complete mining equipment, and rehabilitated 4,000 feet of adit and drifts. Mr. Sanders said the company plans extensive development of the Ophir district in the future, including construction of deep-level tunnels. Six of the best-known properties in the area have already been acquired.

The recent drop in base metal prices has forced the *Bonita Mining and Development Company* to curtail operations at its *Lead Carbonate* mine, with a smaller crew of men mining the Mocking Bird vein. However, the company is continuing to make regular shipments of lead-zinc-gold ore from the mine, located above Gladstone in San Juan County, Colorado, to the custom milling unit of the *Shennandoah Dives Mining Company*. H. P. Ehrlinger of Silverton is Bonita's vice president and general manager.

John L. Adams of Leadville, Lake County, Colorado is operating the Adams lease at the *Fortune* mine in Leadville and is shipping mill grade lead-zinc ore to the *Resurrection Mining Company's* custom milling unit at the portal of the Yak tunnel. The Fortune mine and the Yak tunnel are connected underground.

The Parkdale flotation plant, located near Canon City, Fremont County, Colorado may be reopened in the near future after being closed for a year. New owner of the plant is *International Minerals and Chemical Corporation*, which recently purchased the assets of *Consolidated Feldspar Corporation*, former operator of the property. Other Consolidated property in Colorado involved in the transaction includes a plant in Denver, one in Pueblo, and mineral holdings in Gunnison, Teller, Saguache, and Douglas counties. Norman J. Dunbeck, vice president of the industrial minerals division, reports that International may use the LeBaron-Lawver Process, a method developed by the company which beneficiates ore by a dry process instead of flotation, in the Parkdale plant.

Vanadium Corporation of America will expand the capacity of its uranium-vanadium plant at Durango, Colorado 30 percent, according to D. W. Viles VCA president. Mr. Viles said equipment would be added to handle the additional ore, as well as a "special" ore from the Naturita region. The Durango

plant, a salt roast leaching operation, processes carnotite-type ore. Ore is trucked to the plant from the Navajo Indian Reservation, Utah, and western Colorado, with small tonnages also being trucked in from New Mexico and Arizona. Uranium concentrate is sold directly to the U. S. Atomic Energy Commission, from which VCA bought the property in 1948. A rehabilitation and expansion project undertaken in 1949 increased production at the Durango leaching plant 80 percent.

John Jeffrey and Chief Trujillo of Montezuma, Colorado have made their last mill run of lead-zinc ore from the *Sts. John* mine until spring, and will work the rest of the winter in the *Silver King* mine, which is located in the Montezuma mining district, Summit County. Sts. John ore is processed at the Jeffrey mill.

The *D and M Lead Mining Company* has been shipping lead-zinc ore from its *View of the Park* mining claim to the differential flotation mill of the *Colorado Standard Lead Zinc Mines, Inc.* on Henson Creek, three miles southwest of Lake City, Colorado. Clarence Wright assembled this group of claims located on Wood Mountain in Hinsdale County, and C. R. North is superintendent. D. and M also controls the *Boots, Old Woman* and other claims.

James P. Webb, Breckenridge, Colorado contractor, has been awarded a contract by the U. S. Bureau of Mines for the installation of steel sets at the Leadville drainage tunnel. He plans to begin immediately to erect steel sets between each of the present timber ones, and may get an extension on the contract if the first few months' work proceeds satisfactorily. Mr. Webb also is co-operator of the *Pittsburgh* placer claim near Breckenridge.

The *Climax Uranium Company* of Grand Junction, Colorado was one of a group of 100 new or expanded facilities receiving rapid tax amortization certificates recently. Climax' certificate was for $283,253, covering production of uranium concentrate.

The Cripple Creek Mining and Milling Company has begun sinking a new shaft on its *Wagner* property, which is located on Mineral Hill, Cripple Creek, Colorado. Present plans call for sinking the shaft 200 feet. The firm was organized in 1949, and since then has bought and leased various gold-producing properties in the Cripple Creek area. Shaft sinking operations will also be undertaken at two other nearby mines, the *Cresson* and the *Gold King*. The Cresson gold mine, reopened in 1950 after a one-year shutdown, will be deepened an additional 150 feet from the 21st level. Further sinking of the Gold King below the present depth of 1,007 feet will probably not begin until the present workings have been surveyed.

Development work is reportedly underway at the *John A. Hughes* mine in San Juan County, Colorado. William Brown and James C. White are assembling machinery and materials required to develop the property, which is located west of the Million Dollar Highway at Burro Bridge.

Walter Beard and K. Wright are now operating the *New York* mine [illegible] Montezuma, Colorado. They have [illegible] installed a compressor and motor, and report that a good quantity of lead-zinc-silver ore is being mined at the 400-foot level.

UTAH

The *Vanadium Corporation of America* is raising a new vertical three-compartment shaft to the surface from the 700-foot level of its *Prospector* mine at Marysvale, Piute County, Utah. The new shaft is midway between the nearly parallel striking uranium veins, heretofore developed by separate inclined shafts on the *Prospector* and *Freedom* claims. When completed, the new structure will serve as the central hoisting shaft for Vanadium's mining operations in the district. Surface installations include a new Diesel-electric power plant, while in the shaft a new compressor and hoist have been added. D. W. Viles of Durango, Colorado is vice president in charge of mining and has supervised the Marysvale development.

Rare Metals Mining Company, newly incorporated Salt Lake City, Utah firm, is building a tungsten mill with a 300-ton-per-day capacity 50 miles southwest of Delta in Millard County. According

(*Continued on page* 100)

WHO PIONEERED FULL-FLOW FILTRATION?
WINSLOW, OF COURSE

WHO SAID IT WOULDN'T WORK?
SEVERAL COMPETITORS

WHO IS NOW FALLING INTO LINE?
THOSE SAME COMPETITORS

WHO IS STILL THE NATURAL LEADER?
WINSLOW, OF COURSE

Write for our new **FREE BOOKLET** containing full information.

WINSLOW FILTERS

Winslow Engineering Company • 4069 Hollis St., Oakland 8, Calif.

FOR 33 YEARS

Research and engineering skill at Trona have combined to bring the fabulous mineral wealth of Searles Lake to industry. The unmatched superiority of **TRONA** and **THREE ELEPHANT** Brand chemicals is proof there are no "cobwebs" on the Trona process.

AMERICAN POTASH & CHEMICAL CORP.
3030 West 6th Street Los Angeles 54, Calif.

PROFESSIONAL DIRECTORY

One-Inch Card, $50 Yearly—½-Inch, $30 Yearly. Payable in Advance.

CONSULTING ENGINEERS:

GLENVILLE A. COLLINS
Mining Engineer
Uranium Experience
8 Howard-Canfield Building
SANTA BARBARA, CALIFORNIA

R. L. GILMORE, E. M.
AND ASSOCIATES—ENGINEERS
Mining—Petroleum—Chemical—Metallurgical
Geological Examinations and Reports
Mine Examinations—Mine Management and Operation—Ore Analysis
GEOPHYSICAL EXPLORATION
101 South Elm St. Hastings, Nebraska

GERALD B. HARTLEY, JR.
Mining Engineer
Examination Supervision
642 St. Lawrence Ave. Reno, Nevada

C. P. KEEGEL
Mining and Metallurgical Engineer
Administration Appraisal
Specializing in Management and Consultation in Latin America
707 South 6th St., Las Vegas, Nevada Tele. 571

Cables: KELLCON Sterling 1079
JOHN E. KELLY
Consultant in Natural Resources
Washington Representation
Minerals Petroleum Timber Power Water
316 Southern Building Washington 5, D.C.

Harry E. Krumlaut, E.M.
Consulting Mining Engineer
Examinations — Exploration — Management
2401 E. 6th Street Tucson, Arizona

Joseph Lane, Mill Consultant
Specializing in Flotation Mills, Crushing Plants, Mechanization, Supervision. Speak Spanish.
1451 West 96th Street Los Angeles 47, California

MARK LINTZ
Mining and Metallurgical Engineer
Original sampling thru plant and operations. Correctly integrated functional units in plant design. Metallurgical, Non-Metallics and special process problems.
319 Grant Ave., San Francisco, Calif.

CLAYTON T. McNEIL, E. M.
Mine Examination, Reports, Supervision, Operation
822 Bank of America Bldg. Tel. GArfield 1-2948
SAN FRANCISCO 4, CALIFORNIA

ARNOLD H. MILLER
CONSULTING ENGINEER
General Mine, Mill and Industrial Appraisals, Plant Design, Mechanization.
Cable: "ALMIL" Tel. Cortland 7-0635
120 Broadway New York City 5, N. Y.

MURPHY, F. M.
Consulting Mining Geologist
1201 Maryland Parkway, Las Vegas, Nev.

STANLEY M. MOOS
MACHINERY CONSULTANT
Cable Address "Moos" Apartado 215
Edif. La Mariscala Hidalgo 5-1007
Mexico, D. F.

RODGERS PEALE
Consulting Mining Geologist
315 Montgomery St. San Francisco 4, Calif.

FRANKLIN L. C. PRICE
Registered Mining Engineer
Examinations——————Valuations
1105 Northern Life Tower—Tel. MAin 5134
Seattle 1, Wash.

Walter A. Richelsen
Consulting Mining Engineer
Examination-Appraisal-Management
806 Central Bldg. Elliott 1855
Seattle 4, Washington

ARTHUR R. STILL
Consulting Mining Geologist
Exploration Planning—Property Examinations
Engineering and Geologic Mapping
Small Mine Management
Box 1512 Prescott, Arizona

John Q. St. Clair
Consulting Mining Geologist
300 Builders Exchange Bldg.
Duluth, Minnesota

MILL DESIGN & CONSTRUCTION
Send for Free Bulletin
O. W. WALVOORD CO.
401 High Street • Denver, Colorado

CLIFFORD R. WILFLEY
Mining Engineer
Consulting
2232 Grape St. EAst 0398
Denver 7, Colorado

CLYDE H. WILSON
GEOLOGICAL AND GEOPHYSICAL SURVEYS
Mineral Deposits • Water Supply
Oil Field Structure
WILSON EXPLORATION COMPANY
Los Angeles Salt Lake City
1727 Westerly Terrace Walker Bank Building

HARRY J. WOLF
Mining and Consulting Engineer
Examinations—Valuations—Management
420 Madison Ave., New York 17, N. Y.
Cable: MINEWOLF Tel.: PLaza 9-1700

CHEMISTS, SAMPLERS, SHIPPERS' REP'S:

SHIPPERS' REPRESENTATIVES
at Tacoma Smelter for over 35 years
Control and Umpire Assaying
BENNETTS
Chemical Laboratory, Inc.
901 So. 9th Street • Tacoma 3, Wash.

ARIZ. TESTING LABORATORIES
CLAUDE E. McLEAN, REGISTERED ASSAYER
Analytical and Consulting Chemists
Box 1888 817 W. Madison St. Phoenix

ORE SAMPLES & SHIPPERS' AGENTS
Beach & Company
Phone 258—P. O. Box 574
131 E. Eighth St., Leadville, Colo.
Branches at Amarillo and Dumas, Texas. All Utah smelters and other places by arrangement. Address all communications to the Leadville office. Oldest, most reliable.
Rates reasonable.

B. W. DEASON V. E. WORSLEY
BLACK & DEASON
Assayers and Chemists
Ore Shippers Represented at all Smelters
P. O. Box #1888 Salt Lake City, Utah

THE COLORADO ASSAYING CO.
ASSAYERS, CHEMISTS, and SPECTROGRAPHERS
Est. 1900
Gold, Silver each $1. both $1.50, Copper 75c. Send for Free Copy of Our Mineralogist's Pocket Reference Giving Detailed Information on All the Principal Ores.
2013 WELTON ST., DENVER 1, COLORADO

CUSTOM ASSAY OFFICE and LABORATORY
Commercial and Umpire Assayers
All types of organic and inorganic chemical analysis
Shippers Representatives
105 South Santa Fe, El Paso, Texas
Post Office Box 811 Phone 2-2212

DICKINSON LABORATORIES
Assayers—Chemists—Metallurgists—Umpires
Shippers Representatives at Local Smelters
Representatives at Mexican Border Points for Shippers of Manganese and Fluorspar
1300 West Main Street El Paso, Texas

GOODALL BROTHERS
ASSAYERS AND CHEMISTS
SHIPPERS' REPRESENTATIVES
Established 1909
Helena Montana

HANKS, INC., ABBOT A.
ASSAYERS AND CHEMISTS
Supervision of Sampling at Smelters
Spectrographic Analysis
624 Sacramento St. San Francisco 11

New Mexico
MINERALS LABORATORY
A. K. Veeder, Mgr.
Control and Umpire Assayers
Shippers' Representatives
1303 Grant Street Silver City, N. M.

ANALYSIS OF RARE METALS AND RARE EARTHS IS OUR SPECIALTY

WE DELIGHT IN DOING THE WORK THE OTHERS CAN'T OR WON'T DO

ARIZONA RARE METALS LABORATORY

Registered Assayers and Rare Metals Chemists

"The Test Tells The Tale"

ORACLE

Gold, Silver, Copper, Lead, Zinc Each 75 Cents—Minimum ... $1.00
Any Four—Same Sample $2.50

Prospectors' Special Rates

ARIZONA

Tungsten $3.00
Uranium 5.00
Spectro Analysis (Qualitative) 5.00

All Assays Cash With Order

HAWLEY & HAWLEY
W. E. HAWLEY, Mgr.
Assayers, Chemists, Ore Buyers
Shippers' Representative
P. O. Box 1060 Douglas, Arizona

LEDOUX & CO. (INC.)
Assayers Spectrographers Chemists
Shippers representatives at all seaports and refineries in the United States
359 Alfred Avenue Teaneck, N.J.

NEW WORLD EXPLORATION RESEARCH & DEVELOPMENT CORP.
Foreign & Domestic Consultants
Geology Geophysics
Mine Management
Contract Diamond Drilling
Box 1206 Reno, Nevada

SMALL OR LARGE LOTS OF ORE SHIPMENTS PURCHASED OR FINANCED
Give full particulars . . . tonnage, assays, location, etc.
PIGGOTT PROJECTS
667 Mission St., San Francisco 5, Calif.

SMITH-EMERY COMPANY
Established 1910
Assayers—Chemists
Metallurgists
Spectrographers
Shippers' Representatives
920 Santee Street Los Angeles, Calif.
Member
American Council of Commercial Laboratories

W. H. STOWELL & CO.
Chemists and Assayers
421 Sprague Ave. Spokane, Wash.
Estab. 1890

Wood Assaying Co., Henry E.
Established 1878
ASSAYERS and CHEMISTS
2042 Broadway Denver 2, Colorado

DRILLING COMPANIES:

R. S. McClintock Diamond Drill Company
Spokane, Washington—Globe, Arizona
Diamond Core Drill Contractors
Manufacturer of Diamond Bits and drilling accessories

DIAMOND DRILL CONTRACTORS
Foreign & Domestic
Estimates on Request
Call on New World Exploration for core and non-core diamond drilling
Mineral Deposits
Dam and Bridge Foundations
Grout Holes
For complete exploration service consult us on
Geology Geophysics
NEW WORLD EXPLORATION
Box 1206 Reno, Nevada

DIAMOND DRILL
Contracting Company
S. 18 Stone Spokane 15, Wash.
"DIA-HARD" CORE BARRELS
AND
DIAMOND DRILLING SUPPLIES
Core and Churn Drill Contractors

PRODUCTS AND SUPPLIES:

VAN WATERS & ROGERS INC.
Flotation Chemicals, Mining Reagents
Largest and Most Complete Stocks in Northwest
Seattle, Spokane, Portland, Boise

SEAL-TITE TAMPING BAGS

Save Time and Money in handling Dummies

High wet strength and toughness withstand humidity and hard handling. Supplies of dummies are made up quickly and can be stored underground under wet conditions. Send for samples.

Tamping Bag Co.
210 S. THIRD ST.
MT. VERNON, ILL.

Rocky Mountain News

(Continued from page 9)

to Don Moody, president, the company has a 10-year operating lease on the *House Range* property of the *Mineral Valley Gold Mining Company*, and will attempt to beneficiate the 21 types of minerals found there.

The *New Quincy Mining Company* has let a contract to three miners to begin a program of crosscutting and drifting at its lead-zinc properties near Park City, Utah. The company is furnishing the miners—Dean Boyle, Ken Kummer, and Arthur Workman—with all the necessary equipment and the miners are doing the work for $14 per lineal foot. At present they are using a compressor, an automatic feed drifting drill, a shovel-loader, two trammers, 38 mine cars and two electric chargers. The trio has progressed about 485 feet, but only minor mineralization has been encountered. The exploratory program will cost over $23,000, and is being partially financed by an $11,920 Defense Minerals Exploration Administration Loan.

The *Bullion Monarch Mining Company* is shipping ore from its open cut and underground uranium workings in the Marysvale, Utah district, and at present has more than 250 tons stockpiled and ready for shipping. Continuous development work is underway, with plans for sinking a shaft another 100 feet to a total of 160 feet, and driving of drifts and raises to explore the area in the vicinity of the shaft. About 46 feet of sulfide uranium ore was discovered while sinking.

ALLISON STEEL MANUFACTURING COMPANY

Mine and Mill Buildings • Mine Rails • Ore Cars • Steel Gallows Frames • Ball Mills Muck Plates • Crucible Drill Steel

We offer a complete repair service to the Mining Industry. Our new Machine Shop is equipped to handle your work quickly and economically.

Hot Milling of All Types of Detachable Bits

SOUTH 19TH AVENUE
PHOENIX ARIZONA
PHONE 3-5161

THE MARKET PLACE

SELECT YOUR EQUIPMENT NEEDS FROM THE LARGE STOCK OF DEPENDABLE RECONDITIONED MACHINERY.

LOCOMOTIVES

1—2-2½ ton Whitcomb Battery, 24" gauge
1—2½ ton Jeffrey battery or trolly, 36" gauge
1—3½ ton Mancha battery, 24" gauge, with 2 sets Edison batteries and charging set
1—4 ton Ironton battery, 36" gauge
2—7 ton General Electric permissible battery, 36" gauge
1—7 ton Atlas battery, 36" gauge
3—8 ton Ironton battery, 36" gauge
2—8 ton General Electric battery, 36" gauge
4—10 ton Atlas battery, 36" gauge
1—3 ton Whitcomb gas engine driven, 24" gauge
1—4½ ton Goodman trolley, 36" gauge
1—5 ton Jeffrey trolley, 36" gauge
1—6 ton Goodman trolley, 36" gauge
2—8 ton Goodman trolley, 36" gauge

FLOTATION MACHINES

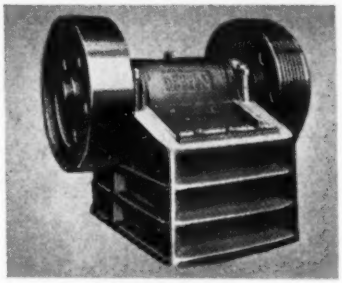
1—New Morse Jetair #7 Hydra-cell
1—New Morse Jetair 2 cell #7
1—Fagregan Single cell
1—6 cell 18" Stearns-Roger
1—6 cell Denver "Sub A" #18
1—6 cell Denver "Sub A" #21

FILTERS

1—4' Single Disc Oliver Filter
1—6' 2-disc American Filter
1—6' 3-disc American Filter
1—4' x 2' Dorrco Filter
1—4' x 6' Morse Drum Filter
1—18" Morse Round Pattern Filter Press
1—36" Merrill Triangular Filter Press
1—12# Sweetland Filter Press, 36 leaves

CONE CRUSHERS

1—3' Symons Cone Crusher
1—4' Symons Cone Crusher



JAW CRUSHERS

2—9" x 14" Universal, #3M
1—9" x 15" Wheeling
1—9" x 15" Farrell
1—9" x 16" Universal
1—8" x 24" Rogers
1—8" x 36" Universal
1—11" x 18" Universal
1—24" x 13" Farrell

BALL & ROD MILLS

1—4' x 4' Standard Ball Mill
2—6' x 48" Hardinge Conical Ball Mills with air swept equipment
1—8' x 22" Hardinge Conical Pebble Mill
1—3' x 8' Marcy Rod Mill

CLASSIFIERS

1—48" x 15' Dorr Multizone Classifier
1—48" x 18' Akins Spiral Classifier
1—40" x 20' Morse Spiral Classifier

THICKENERS

1—12' Dorr lowhead thickener with 10' deep redwood tank
1—24' Dorr lowhead thickener with 12' deep redwood tank

COMPRESSORS

1—64 CFM Gardner-Denver, 4½" x 4"
2—88 CFM Ingersoll-Rand, 7" x 5"
1—121 CFM Gardner-Denver, 8" x 6"
1—173 CFM Chicago-Pneumatic, 9" x 8"
1—173 CFM Ingersoll Rand, 9" x 8"
1—179 CFM Ingersoll Rand, 12" x 10"
1—213 CFM Blaisdell, 14" & 9" x 8"
1—230 CFM Gardner-Denver, 6" & 4¾" x 5"
1—447 CFM Ingersoll-Rand, 14" & 7½" x 12"
1—637 CFM Sullivan, 14" & 8¾" x 10"
1—698 CFM Union, 16" x 12"
1—800 CFM Ingersoll-Rand 18" & 11" x 16"
1—840 CFM Laidlaw, 13" x 10"
1—1418 CFM Ingersoll-Rand, 24" & 13" x 16"
1—105 CFM Ingersoll-Rand driven by I-R, 4 cyl. gas engine

PORTABLE COMPRESSORS

1—210 CFM Worthington "Blue Brute" driven by 6 cyl. Continental gas engine
1—240 CFM Schramm driven by 4 cyl. Buda gas engine
1—270 CFM Sullivan driven by 6 cyl. Buda gas engine
1—310 CFM Sullivan driven by 4 cyl. Buda gas engine
2—310 CFM Gardner-Denver driven by 4 cyl. Buda gas engines

ROLL CRUSHERS & PULVERIZERS

1—24" x 24" Jeffrey single roll
1—24" x 36" McNally-Pittsburg double roll
1—30" x 45" Jeffrey single roll
1—36" x 40" Jeffrey double roll
1—26" x 18" Williams Pulverizer
1—30" x 16" Williams Pulverizer
1—36" x 48" Jeffrey Flextooth Crusher

Serving the World's Mining Regions since 1898.

MORSE BROS. MACHINERY COMPANY

2900 Brighton Blvd. **Denver 1, Colorado**

FOR SALE

Complete Assay Office Equipment
Like New at Give-away price.
Phone or write Sam Nikkel,
Attorney-at-Law, Cripple Creek, Colo.

MOTOR GENERATORS

1—500 KW G.E. Syn. 275 V. 900 RPM
1—400 KW G.E. Syn. 575 V. 720 RPM
1—300 KW G.E. Syn. 275 V. 1200 RPM
2—300 KW WEST. Syn. 275 V. 1200 RPM
1—300 KW Ridgway Syn. 275 V. 1200 RPM
1—200 KW G.E. Syn. 275 V. 1200 RPM
1—200 KW WEST. Syn. 275 V. 1200 RPM
1—200 KW RIDGWAY Syn. 275 V. 900 RPM
1—150 KW G.E. Syn. 275 V. 1200 RPM
1—150 KW WEST. Syn. 275 V. 1200 RPM
1—100 KW RIDGWAY Syn. V. 1200 RPM

LOCOMOTIVES

2—30 T JEFFREY 250 V. 3-MH-77 48-36" Ga.
1—25 T G.E. 500/250 V. 3-HM-824-A 44-36" Ga.
1—20 T JEFFREY 250 V. MH-77 48-36" Ga.
1—20 T G.E. 250 V. (Tandem) HM-809 36" Ga.
1—13 T JEFFREY 250 V. MH-110 44-36" Ga.
1—13 T JEFFREY 500 V. MH-110 44-36" Ga.
1—10 T JEFFREY 250 V. MH-2110 48-36" Ga.
2—10 T JEFFREY 250 V. MH-110 42-36" Ga.
2—10 T GOODMAN 250 V. 36-B 36" Ga.
1—10 T WEST. 250 V. ML-907-C 36" Ga.
2— 8 T WEST. 250 V. ML-906-C 44-36" Ga.
1— 8 T WEST. 250 V. ML-925-LK 24" Ga.
2— 6 T JEFFREY 250 V. MH-88 44-36" Ga.
2— 6 T JEFFREY 500 V. MH-88 44-42" Ga.
2— 4 T GOODMAN 250 V. MS-4-E 36-24" Ga.

WALLACE E. KIRK COMPANY
504 Grant Building, Pittsburgh 19, Penna.

BUSINESS MEN'S
CLEARING HOUSE
EST. IN 1903
BEGINS ITS

50th YEAR

Of Service
To The Mining Industry

If you want a good job in mining or want a good man to fill a good job, write, phone, or come in

601 MIDLAND SAVINGS BLDG.
DENVER, COLORADO

Reconditioned Hoists and Fans

1—Sullivan, Model A211 double drum electric slusher with 15 HP, 220/440 volt, 3 phase, 60 cycle motor, 1775# R.P. @280 F.P.M.

1—Joy, Class FF-311 three drum electric slusher, with 10 HP, 220/440 volt, 3 phase, 60 cycle motor, 2200# R.P. @165 F.P.M.

4—Ingersoll-Rand, Model 20NM2-C double drum electric slushers, with 20 HP, 220/440 volt, 3 phase, 60 cycle electric motors, 2200# R.P. @300 F.P.M.

1—Vulcan single drum mine hoist, depth indicator, single band brake, externally contracting clutch, herringbone gears with 85 HP, 220/440 volt, 3 phase, 60 cycle motor, with controls and grids. Approximately 4400# R.P. @487 F.P.M.

3—Coppus TM-6 Blowers with or without motor, 3520 CFM through 100' of 12" vent pipe.

6—New Coppus, type SP125 Vano Blowers, 385 C.F.M., through 100' of 6" vent pipe.

Cate Equipment Company
49 East 9th South
Salt Lake City, Utah
Phone: 9-2021

RECONDITIONED AND GUARANTEED MINING AND MILLING MACHINERY

FLOTATION MACHINES

1—#24 8-cell Denver "Sub-A" with wood tank, new impellers
1—#15 2-cell Denver "Sub-A" with wood tank—Rubber Impellars

CLASSIFIERS

1—6' x 22' Dorr Duplex Classifier
3—Deister Cone Baffle Classifiers

CONVEYORS

1—18" x 35' long, complete with belt and motor
1—14" x 11' long, Belt Feeder, on steel channels
1—18" dia. x 26" face Dings Mag. Pulley, complete with mech., belt & charger

AIR COMPRESSORS

1—8 x 7¾ Sullivan Horizontal Air Compressor, direct connected to 20 HP AC Motor, complete with Receiver—Semi portable
1—8 x 8 I. R. Horizontal Air Compressor
1—445 cu. ft. I. R. Imp. 10 Air Compressor
1—10 x 12 Gardner Horizontal Air Compressor
1—3½ x 3½ Gardner Denver Vert. Air Compressor—practically new

CRUSHERS

1—9" x 40" Austin-Western
1—10" x 20" Allis-Chalmers
1—6" x 12" Wheeling V-flat to 7½ HP AC Motor

SCALES—TRUCK

1—40 Ton Fairbanks Scale with Mauer weighing beam

MOTORS

1—15 HP AC Slip-ring 1150 RPM
2—20 HP Gen. Elec. Slip-ring 1200 RPM
1—30 HP West. Slip-ring 840 RPM
1—35 HP AC Slip-ring 850 RPM
4—1 HP West. Squirrel Cage 1200 & 1800 RPM
1—2 HP Louis-Allis Squirrel Cage 1140 RPM
5—5 HP Gen. Elec. Squirrel Cage 860 to 1800 RPM
2—10 HP Gen. Elec. BB Squirrel Cage 1160 RPM
5—15 HP Gen. Elec. BB Squirrel Cage 1160 RPM
3—20 HP Gen. Elec. BB Squirrel Cage 1170 RPM
2—25 HP Gen. Elec. Squirrel Cage 600 RPM & 1200 RPM
1—25 HP Crocker-Wheeler Squirrel Cage 1740 RPM
1—50 HP West. Squirrel Cage 1710 RPM
New and Used Single Phase Motors from ¼ HP to ½ HP

PUMPS—SAND

1—3" Wilfley with 10 HP AC Motor
1—2" Kimball Krogh—Belt Drive
1—2" Sackett—Belt Drive

MISCELLANEOUS

1—No. 3 Dillon-Box Sgl. Drum Air Hoist, 1000 # Rope Pull
1—3½' x 3' Conditioner—steel tank
1—#24-A Standard, 5-turn Humphrey Spiral
3—6' x 8' Agitator Mechanisms, complete with motors & "A" Frames
3—37½ KVA Transformers, 440-110/220 volts
1—12" x 5" Denver Lab. Batch Ball Mill—motorized
1—Butchart Concentrating Table
1—20' x 10' Wood Tank, with Thickener Mech., steel superstructure, motor and diaph. pump
1—32" x 16" Davis Crushing Roll
1—Jeffrey Dry Reagent Feeder, Vib. Type
1—18" Denver Cone Dry Reagent Feeder
1—2" Jaeger Pump direct connected to 2⅞ x 2¾ Wisc. Gas Engine, mounted on solid rubber tires
1—6½' x 5' Conditioner, Steel Tank

WRITE FOR STOCK LIST NO. 12

FLORENCE MACHINERY AND SUPPLY CO.

Suite 904 Equitable Bldg. **C. J. PARRISH, Manager** **Denver 2, Colorado**

MOTORS—M.G. SETS—TRANSFORMERS

ENGINEERED AND REBUILT BY SPECIALISTS IN OUR MODERN PLANT

MOTOR GENERATOR SETS

QU.	KW	MAKE	RPM	VOLTS DC	VOLTS AC
1 (3-U)	2400	Whse.	720	600	2400/4800
3	1000	Whse.	514	600	11000/6600
4	1000	G.E.	514	600	11000/6600
1	1000	G.E.	514	600	2300
2	500	C.W.	720	575	2300/440
1	400	C.W.	1200	125/250	440/2300
2	250	Whse.	1200	125/250	2300
1	200	Ridgway	900	275	2300
2	200	Whse.	1200	125/250	440
1	155	G.E.	720	250	2300/440
2	150	Whse.	1200	250	2300
1	100	Al.Ch.	1200	125/250	4000/2300
1	100	Delco	1200	125/250	440/220
1	100	Ridgway	1200	275	4000/2300
1	100	C.W.	1200	125	440/220
1	85	C.W.	1200	250	440/220
1	75	Al.Ch.	900	250	2300
1	75	Whse.	900	75	2300
1	25	Ideal	1750	125	220
1	25	Al.Ch.	1200	250	440/220
1	20	Al.Ch.	1200	250	440/220
3	15	Al.Ch.	1200	250	440/220

We can furnish any of these sets with exciters and VARIABLE VOLTAGE CONTROL engineered and rebuilt to your requirements.

Motor Generators of modern design, complete with control—still on their original foundations—available for immediate shipment.

(3)—G.E. 1500-KW, 250-VDC, 514 R.P.M., cpd., interpole, pole face windings, 2100-HP syn. motors, .8-PF, 13,200-V, 3-p, 60 cy. will reconnect to 6600 V. or 4160-V.

SLIP RING MOTORS—CONSTANT DUTY
3 phase—60 cycle

QU.	HP	MAKE	TYPE	VOLTS	RPM
1	1800	G.E.	MT 498	2300	357
1	1200	G.E.	MT 26	2200	277
2	1000	Al.Ch.	ANY	2200	235
1	800	G.E.	MT	2200	440
1	700	Whse.	CW	2300	720
1	600	G.E.	MT 20	2300	360
1	500	Al.Ch.	ANY	2200	514
2	500	G.E.	I-16-M	2300	450
1	400	G.E.	MT 412	2200	440
1	250	Whse.	CW 937	440	1200
1	250	Al.Ch.	ANY	440	720
1	250	G.E.	MT 414	2200	300
1	125	Whse.	CW 870	2200	900
1	100	Whse.	CW 766	440	1200
1	100	F.M.	H 20 C	440	900
2	100	G.E.	I-15A-M	2300	514

SYNCHRONOUS MOTORS

QU.	HP	MAKE	P.F.	VOLTS	RPM
1	6000	G.E.	100	2300	90
1	3000	Whse.	80	4800/2400	720
2	2100	G.E.	100	2300	360
2	1750	G.E.	100	2300	3600
1	750	G.E.	80	2300	450
1	600	G.E.	100	440	360
1	700	G.E.	80	2300	720
1	250	G.E.	100	2300	514
1	200	Whse.	80	440	1200
1	187	G.E.	80	440	720
1	150	G.E.	100	2200	900
1	150	G.E.	100	550	600
1	120	G.E.	80	550	450
2	135	G.E.	80	4000/2200	1200
3	125	El. Mchy.	100	4800/2400	900
1	125	G.E.	80	2200	900
2	100	Whse.	80	440	1800
1	100	Ideal	80	440	900
2	100	G.E.	80	440	600

With these we can supply—Manual, Semi on full magnetic reduced or full voltage control.

TRANSFORMERS (POWER)

QU.	KVA	MAKE	TYPE	PHASE	VOLTAGE
1	2750	G.E.	H	3	13,800-2400/4160Y

This now being completely rewound with (2) 2-½% taps above and below on 13,800 side.

3	250	Packard	A	1	12,200-2200
3	150	Packard	A	1	2300-230/460
3	100	G.E.	H	1	33,000-2300
3	25	G.E.	H	1	2400-120/240
40 (new)	3	Al.Ch.	OISC	1	2400-120/240

SPECIAL—800 single drum Norberg Mine Hoist with 1000 H.P. Whse. motor 515/580 V, 66/74.5 R.P.M., also 860/976 K.W. flywheel M.G. Set 585/515 V, 700/630 R.P.M. with 1000 H.P. Whse. slip ring motor 2200 V, 3 ph 60 cy. 720/630 R.P.M. with all controls. Will send all or any part of this.

T. B. MAC CABE COMPANY

4302 CLARISSA STREET — PHILADELPHIA 40, PENNA.

CABLE ADDRESS "MACSTEEL" PHILADELPHIA, PA. — PHONE DAVENPORT 4-8300

POSITIONS OPEN

Engineering, Technical, Mechanical

MGR., Indust'l Personnel, labor, fgn.	OPEN
CONSTRUC'N ENGR., C. E., U. S.	to $825
CONSTRUC'N ENGR., fgn.	to $850
COST ENGR., construc'n, fgn.	$800
GEN'L SUPT., mine, mill, fgn.	$650
MINE SUPT., fgn.	OPEN
KILN SUPT., cement exp.	$650
VENTILATION ENGR., mine, fgn.	$500
MINE FOREMAN, fgn.	$450-$550
MINE SHIFT BOSS (3) fgn.	$400 & $435
MINE ENGRS., expd., U.S. & fgn.	$350-$475
JR. MINE ENGRS., fgn. & U. S.	$325-$405
GEOLOGIST, mine, U. S.	OPEN
MILL SUPT., fgn.	$700
METALLURGISTS, research, U S. & fgn.	to $700
ASST. MILL SUPTS. U S. & fgn.	$500
PLANT ENGR., mill mtce.	$500
METALLURGIST, mill, fgn.	$500
METALLURGIST, shift foreman	$350
METALLURGISTS (3) metal fab.	to $430
ASST. SMELTER f'man, fgn.	to $450
CHEMISTS, assayers, U.S.	$340-$450
DRAFTSMAN, mine, map, U.S.	$400
CHF. Draftsman, mine, fgn.	OPEN
CIVIL ENGR., hydraulic, fgn.	$500
SAFETY ENGR., indust'l	$475
E. E. GRADS, field work	$325-$485
ELEC. ENGR., office, fgn.	OPEN
WELDING ENGR., U.S.	to $475
CHURN DRILLERS, fgn.	Rm. bd. & $500
MASTER MECH.-electrician, coal	OPEN
MECH. CHEM., mine engrg grads	$325-$375
MECH. ENGR., R.R. exp. fgn.	$450
ASST. FOUNDRY F'man, fgn.	OPEN
ASST. CHF. Operator, steam, fgn.	to $450
POWER HOUSE OPR., steam, U.S.	$400
ASST. Warehouse supt., spk Span., fgn	OPEN

GLENN B. WILSON
EMPLOYMENT SPECIALISTS
306 CONTINENTAL OIL BUILDING
Denver 2, Colorado

THE MARKET PLACE

AIR COMPRESSORS
3—690 Ft. Worthington, 15 x 9¼ x 12. 2 Stage Plate Valve. V Belt or Short Flat Belt Idler Drive with or without Electric Motor.
1—3,000 Ft. Chgo. Pneu. Class OCE. 500 H.P., 3/60/2200 V.
CONVEYOR BELTS
1 Roll. 530 Ft. New 36 In. 6 Ply. 32 Oz.. 1 8 x 1 16. First Grade.
2 Rolls. 1300 Ft. Used 36 In. 7 Ply. Good for Emergency or Lining Chutes, etc.
BOILER—100 H.P. Ames 125 lb. Pres. ASME. Economic Type.
RAILROAD CARS—60—8,000 Gal. Cap. Class 3 Tank Cars. 50—20 Yd. Cap. Steel Air Dump Cars. 100—50 Ton Cap. Flat Cars.
LOCOMOTIVES—80 Ton Whitcomb Diesel Electric.
45 Ton Plymouth Diesel Locomotive.
30 Ton Whitcomb Gasoline.
45 Ton Vulcan Gasoline.
STEEL STORAGE TANKS
2—74,000 Bbl. Cap. Vert., Clean. Like New. 114 Ft. Dia. 40 Ft. High.
3—1000 Bbl. i.e. 42,000 Gal. Cap., 29'8" Dia. 8 Ft. High. New. Bolted.
6—New 25,000 Gal. Cap., ⅜ Inch Shell. Underwriters Label. Welded.
8—New 20,000, 6—15,000 & 4—10,000 Gal. Cap. Underwriters Label. Horizontal Welded.
STEEL SHEET PILING—900 Tons Beth. SP-4. Straight Web. 23 Lb. Per. Sq. Ft., Lengths 20 to 48 Ft. Located Emerson, Ga.
250 Tons Beth. DP-2. Deep Arch Web. 27 Lb. Per Sq. Ft., Lengths 20, 27 and 40 Ft. N. Y. Warehouse.
DRYERS-KILNS—2—6'3" x 130'. 2—9' x 160' Kilns.
70 In. x 35 Ft. Ruggles Coles XB Indirect Dryer.
1—6½ Ft. x 50 Ft. Rotary Cooler.
4 Ft. x 20 Ft. Devine Dryer.
4 Ft. x 28 Ft. Rotary Dryer.
2—90" x 40' Semi-Indirect Dryers.
JAW CRUSHERS—24 x 36 Farrell. 36 x 42 Buchanan. 40 x 48 Buchanan.
BALL MILL—6 Ft. x 48 In. Hardinge Ball Mill with or without Air Separator.
VIBRATING SCREEN — 3 Ft. x 5 Ft. Hummer. 3 Deck.
RING ROLL MILL—1—No. 1½ Sturtevant.
DIESEL GENERATORS—2—Superior 50 KW. 3 Ph., 60 Cy., 220 Volt.

DARIEN, 60 E. 42nd Street, New York 17, N. Y.

BARGAINS IN GOOD USED EQUIPMENT

ELECTRIC MINE HOISTS
1—500 HP Wellman-Seaver-Morgan Double Clutched Steel Drum Slope Hoist. Will spool 2000' of 1¼" rope.
1—400 HP Vulcan Double Clutched Drum Hoist. Will spool 5000' of 1⅛" rope. Contracting external clutches, Herringbone gears, Lilly safety control, air brakes.
1—600 HP Nordberg Single Drum Hoist. Will spool 5000' of 1⅜" rope.
1—500 HP Ottumwa Single Drum Hoist. Will spool 5000' of 1¼" rope.

All of the above Hoists have 3 phase, 60 cycle, 2300 volt motors, controls and all necessary appurtenances.

We have all types of Hoists with 100 to 1500 HP motors, suitable for slope, shaft and drift mines. Complete specifications on requests.

TROLLEY LOCOMOTIVES, 250 VOLT DC, BALL-BEARING
2—20-ton Jeffrey MH-77
2—15-ton West. 908-C
2—15-ton Goodman 36-A
5—15-ton Jeffrey MH-110
4—13-ton G. E. HM-827
2—13-ton Jeffrey MH-110
1—10-ton Jeffrey MH-110
4—10-ton Goodman 34-B
12—8-ton Jeffrey MH-100 with reels
3—8-ton G. E. HM-819 with reels
4—8-ton West. 905-C with reels
4—8-ton G. E. HM-834 with reels
2—6-ton Jeffrey Locomotives, Serial Nos. 8135 and 8136 Type MH-88, 250 V DC, ball-bearing motors. Height overall .... 28"
Length overall ..... 13'
Wheel base ..... 54"
Outside armorplate frame ..... 2"
37F Ground potential controller Class 2, Jeffrey contactors. Speed ... 6.6 MPH
Drawbar pull ..... 3000#
Track gauge ..... 26"
but can be changed to any gauge.

Track gauges 24" to 42". Complete with new Jeffrey steel strip resistances. All have been rebuilt and any part showing any wear was replaced with new.

BATTERY LOCOMOTIVES
28—4-, 5-, 6-, and 8-ton 24" to 36" track gauge Battery Locomotives with good batteries. Just taken out of service.

MOTOR GENERATOR SETS, 275 V, 1200 RPM, 2300/4100 V
1—300 KW West., full automatic switchgear
1—300 KW G. E. full automatic switchgear
4—200 KW G. E. full automatic switchgear
3—150 KW G. E. manual switchgear

ROTARY CONVERTERS—TYPE HCC-6, 275 V, 1200 RPM, 2300/ 100 V
1—300 KW G. E.
4—200 KW G. E.
1—100 KW G. E.
2—250 KW West. Mine Type Rectifiers

LOADING MACHINES, 250 VOLT DC
6—14-BU-3PE Joy
4—14-BU-7RBE Joy
6—11-BU Joy
6—8-BU Joy
10—7-BU Joy
2—Myers-Whaley No. 3 Automats, practically new.

CABLE REEL AND BATTERY SHUTTLE CARS—ALL TYPES

Complete specifications on any of the above equipment on request.
All types of equipment for coal, metal, potash and salt mines. Mail us your inquiries for hard-to-find equipment.

COAL MINE EQUIPMENT SALES COMPANY

FRANK J. WOLFE — SHELDON J. WOLFE
306-307 BEASLEY BUILDING • LONG DISTANCE PHONE 34 • TERRE HAUTE, INDIANA

QUICKSILVER FURNACE PLANT

2½ by 30 ft. rotary kiln, rated capacity 20 ton per 24 hr. complete with seals, supports, drive, fan, condensers, feeder, and 15 inch. jaw crusher, all for $4,000.00 cash f.o.b., location good, road 16 miles from Cloverdale, Calif. Write Buckman Laboratories, Inc., Geyser Road, Cloverdale, Calif.

TECHNICAL BOOKS

Principals of Mineral Dressing —Gaudin	$6.00
Non-Ferrous Production Metallurgy—Bray	$6.00
Textbook of Quantitative Analysis—Hall	$3.50
The Economics of Mining—Hoover	$7.50
An Introduction to Metallurgy —Newton	$5.50
Centrifugal & Axial Flow Pumps—Stepanoff	$7.50
Automotive and Construction Equipment—Lindgren	$4.50
Mine Plant Design—Staley	$5.00
Elements of Mining—Young	$6.50
Handbook of Nonferrous Metallurgy—Liddell	$6.50

All books available for immediate delivery

Send order to: MINING WORLD
121 Second St., San Francisco, Calif.

CHANGE OF ADDRESS

CIRCULATION DEPT.
MINING WORLD with which is combined the Mining Journal
121 Second St., San Francisco 5, Calif.

Please change the address of my Mining World subscription.

NAME .....
OLD ADDRESS .....
NEW ADDRESS .....
NEW COMPANY CONNECTION .....
NEW TITLE OR POSITION .....

Market Place Advertising

360 inches	$5.50
180 inches	$6.00
90 inches	$6.50
45 inches	$7.00
Less than 45 inches	$7.50

Contract rates based on total number of column inches used within one year. 30 column inches equal one page.
Closing date: 1st of month preceding publication.
(Used and reconditioned equipment, liquidations, property sales only)
For additional 10,000 WORLD MINING export distribution. Add 50%

MINING WORLD

with which is combined
MINING JOURNAL
The Production Magazine of the Metal Mining Industry
Published at
SAN FRANCISCO, CALIFORNIA
$3.00 Per Year ..... 13 Issues
(Includes Mine Development and Directory Number)

INDEX OF ADVERTISERS

Agence Miniere et Maritime 81
Allen-Sherman-Hoff Pump Co. ..... Inside Front Cover
Allis-Chalmers Mfg. Co. (General Machinery Div.) 70
Allis-Chalmers Mfg. Co. (Tractor Div.) 48, 49
Allison Steel Mfg. Co. 100
Alloy Steel & Metals Co. 12
American Cyanamid Co. 20
American Manganese Steel Div. ..... Inside Back Cover
American Mine Door Co. 80
American Potash & Chemical Corp. 98
American Smelting & Refining Co. 94
American Zinc, Lead & Smelting Co. 56
Anaconda Wire & Cable Co. 52
Arizona Rare Metals Laboratory 100
Arizona Testing Laboratories 99

Baldwin-Lima-Hamilton Corp. 13
Beach & Co. 99
Behre Dolbear & Co. 81
Bemis Bros. Bag Co. 78
Bennett's Chemical Laboratory 99
Black & Deason 99
Boyles Bros. Drilling Co. ... 55
Buckman Laboratories, Inc. 103
Bucyrus-Erie Co. 62
Bunker-Hill & Sullivan Mining & Concentrating Co. 56
Business Men's Clearing House 101

Card Iron Works, C. S. 74
Cate Equipment Co. 101
Caterpillar Tractor Co. ... 1, 16
Coal Mine Equipment Sales 103
Coast Mfg. Co. 76
Collins, Glenville A. 99
Colorado Assaying Co. 99
Colorado Fuel & Iron Corp. 76
Colorado Iron Works 60
Columbian Steel Tank Co. . 95
Consolidated Pneumatic Tool Co. . 79 (World Mining Only)
Copco Pacific, Ltd. 90
Cummins Engine Co. 44
Custom Assay Office 99

Darien Corp. 103
Deister Concentrator Co. ... 81
Denver Equipment Co. 58
Denver Fire Clay Co. 78
Diamond Drill Contracting Co. 100
Dickinson Laboratories 99
Dings Magnetic Separator Co. 42
Dorr Co. 10

Edwards Wire Rope 7
Eimco Corp. ..... 6, 68, 69, Outside Front Cover
Emsco Concrete Cutting Co. 95
Euclid Road Machinery Co. 65

Federal Pipe & Tank Co. .. 104
Florence Machinery & Supply Co. 102

Galigher Co. 75
Gardner-Denver Co. 2
Gilmore, R. L. 99
Goodall Brothers 99
Goodall Rubber Co. 72
Goodman Mfg. Co. (Mancha Div.) . 62 (World Mining Only)
Greensburg Machine Co. ... 74

Hanks, Inc., Abbot A. 99
Hardinge Co. 63
Harnischfeger Corp. 11
Hartley, Gerald B., Jr. 99
Hawley & Hawley 100
Heil Co. ..... 7 (World Mining)

Industrial Air Products Co. . 96
International General Electric Co. ..... Inside Front Cover (World Mining)
International Smelting & Refining Co. 56

Jeffrey Mfg. Co. 54
Johnson, Herbert Banks ... 81
Joy Mfg. Co. 4, 5

Keegel, C. P. 99
Kelly, John E. 99
Kirk, Wallace E., Co. 101
Krumlauf, Harry E. 99

Lake Shore Engineering Co. 18
Lane, Joseph 99
Ledoux & Co. 100
Le Roi Co. 14, 15
LeTourneau, Inc., R. G. ... 8, 9
Link-Belt Speeder Corp. ... 3 (World Mining)
Lintz, Mark 99
Longyear Co., E. J. 66
Lundberg Explorations Ltd. . 81

MacCabe Co., T. B. 102
Magma Copper Co. 56
McClintock, R. S. 100
McNeil, Clayton T. 99
Meissner Engineers, Inc., John F. 81
Merrick Scale Mfg. Co. 86
Miller, Arnold H. 99
Mine & Smelter Supply Co. 60
Minerals Laboratory 99
Moos, Stanley M. 99
Morse Bros. Machinery Co. 80, 101
Murphy, F. M. 99

New World Exploration, Research & Development Corp. 100
Nordberg Mfg. Co. 73

Pacific Foundry Co., Ltd. .. 76
Pacific Pipe Co. 86
Peale, Rodgers 99
Piggott Projects 100
Portland Woolen Mills 82
Pressed Steel Car Co. ..... 72 (World Mining Only)
Price, Franklin L. C. 99

Resisto-Loy Co. 83
Richelsen, Walter A. 99

Sauerman Bros., Inc. 80
Simplex Wire & Cable Co. . 79
Smit, Anton & Co. ..... 76 (World Mining Only)
Smith-Emery Co. 100
Smith, Paul F. 104
South American Minerals & Merchandise Corp. ..... 76 (World Mining Only)
St. Clair, John Q. 99
Standard Oil Co. of Calif. . 51
Stearns Roger Mfg. Co. 92
Still, Arthur R. 99
Stowell & Co., W. H. 100

Tamping Bag Co. 100
Timken Roller Bearing Co. . 89
Traylor Engineering & Mfg. Co. 67

Udy, Marvin J. 81
Ultra Violet Products Co. . 88
United States Steel Co. ... 46

Van Waters & Rodgers, Inc. 100
Vulcan Iron Works 83

Walwoord Co., O. W. 99
Wedge Wire Corp. 88
Western Machinery Co. 40
Western Rock Bit Mfg. Co. . 3
Wilfley, Clifford R. 99
Wilfley & Sons, A. R. Outside Back Cover
Wilson, Clyde H. 99
Wilson, Glenn B. 102
Winslow Engineering Co. .. 98
Wolf, Harry J. 99
Wood Assaying Co., Henry E. 100

Yuba Mfg. Co. 64

CRUSHERS

18x36 jaw crusher, portable plant.
15x30 jaw crusher, Blake type
12x24 Allis-Ch., brand new
10x24 Cedar Rapids
2 ft. Symons cone

PAUL F. SMITH
39 W. Adams St. — Phoenix, Arizona

WANT TO BUY

Require several large double drum hoists, with electrical equipment.

Please send all details.

Box K-1, MINING WORLD,
121 Second St., San Francisco 5, Calif.

FEDERAL PIPE & TANK CO.
—WOOD PIPE and WOOD TANKS—
Factory and Main Office
6851 E. Marginal Way
Seattle 8, Wash.

CLASSIFIED SECTION

8 pt. type 12c per word. 10 pt. type 18c per word. Minimum charge $4.50.

(For Box numbers addressed to Mining World, add 50c)

Boxed ads (display) in either Market Place or Classified Sections—$7.50 per column inch.

(See Market Place Section for lower contract rates).

Closing Date: If proof required, 1st of preceding month, otherwise 10th.

Positions Desired

20 YEARS EXPERIENCE dra[g]line, sh[o]el, and placer dredges. Ac[c]ept eith[er] foreign or U.S. location. M[a]rried. O[ne] child. Desire responsible po[si]tion wi[th] reliable company. Reply Box A-1, MI[N]ING WORLD, 121 Secon[d] St., S[an] Francisco 5, Calif.

ASSAY DEPT. MANAGER or W[ork] AND FIRE ASSAYER. Well exper[i]enced in all except WO[rk] methods. [Ad]K. Stubblefield, Star Route, Cambrid[ge] Idaho.

Business Opportunities

Have one vein of horn silver, 8 ft. wi[de] One vein 5 ft. x 9 in. wide. One ve[in] Galena two ft. wide, also gold a[nd] copper. Need $150,000.00 for develo[p]ment and equipment. For particul[ars] address, H. S. Hardees, P. O. Box "[C] Cody, Wyoming.

Equipment for Sale

FOR SALE: Mill of 50-ton capacity l[o]cated 8 miles north of Baker, Cal[if] on highway 127. Practically new equi[p]ment, new buildings, and well wi[th] unlimited water at 65 feet below su[r]face. Excellent location for private [or] custom mill. For further details wri[te] J. Bryant Kasey, Box 968, Bakersfie[ld] Calif.

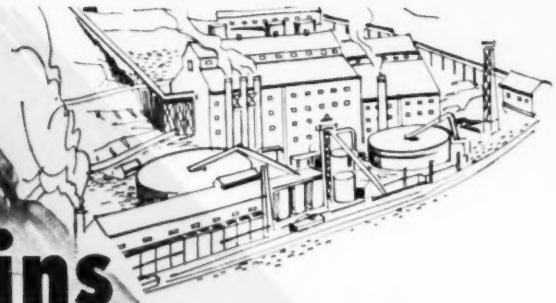
FOR SALE: Complete Assay Office Equ[ip]ment except furnace. Like New at gi[ve] away price. Phone or write Sam Nikk[o] Attorney at Law, Cripple Creek, Col[o]rado.

Miscellaneous

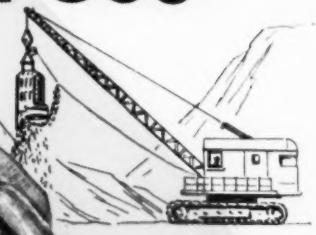
WANTED: 50 to 75 ton flotation m[ill] for lead, zinc property. Must guarant[ee] and install. Reply Box L-1, MINI[NG] WORLD, 121 Second St., San Franc[isco] 5, Calif.

MINING PROPERTIES WANTED—We wish to buy or lease either metal[lic] or non-metallic, open pit or unde[r] ground properties of merit in Nevad[a] Arizona or California. Send full d[e]tails in first letter.
NEW WORLD EXPLORATION, B[ox] 1206, Reno, Nevada.

WANTED TO BUY: Copper or le[ad] mine or dumps, milling ore. ALS[O] 200 KVA diesel generating plant. Rep[ly] Box A-2, MINING WORLD, 121 Se[c]ond St., San Francisco 5, Calif.



Amsco Chains Get Tougher With Use



How AMSCO Manganese Steel Chains Acquire Progressively Greater Resistance to Impact and Abrasion.

Actual case histories prove that AMSCO Manganese Chains outlast ordinary chains by more than 6 to 1 where impact and abrasion exist. For example, on one conveyor operation, ordinary chain had to be completely replaced every three months. When AMSCO Manganese Steel Chain was installed, only a small fraction of the links were replaced during a test period of over 24 months.

Users of AMSCO Chains benefit by unusual freedom from expensive chain replacement, breakage, maintenance-down-time and other problems caused by impact and abrasion conditions.

AMSCO Manganese Steel Chains have the unique ability to work-harden with use. In rough service, they develop a surface hardness up to 500 Brinell. They also acquire a hard glass-like polish that helps shrug off grinding abrasion. All AMSCO Manganese Steel products — tough when produced — possess the extra-value quality of actually increasing durability with in-use battering and grinding.

AMSCO Chains are made of Manganese Steel —the "Toughest Steel Known." They are produced in many standard and special shapes by American Manganese Steel Division—largest producer of manganese steel for all industry.

If you use chain, and desire a more durable alloy, you are invited to contact AMSCO. There's a good chance we can save you money and provide chains that will outlast your service life expectations.

Drag Line Type Chain—Mining & Excavating

AMSCO Chain Assume Many Forms To Serve Industry. A Few Are:

Detachable Chain—Bucket Elevating

Pinlock Type with Cast-on Dog—Log Hauling

840 Series Chain—Bucket Elevating

Riveteless Chain—Mining

Clinker Drag Chain—Cement Milling

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

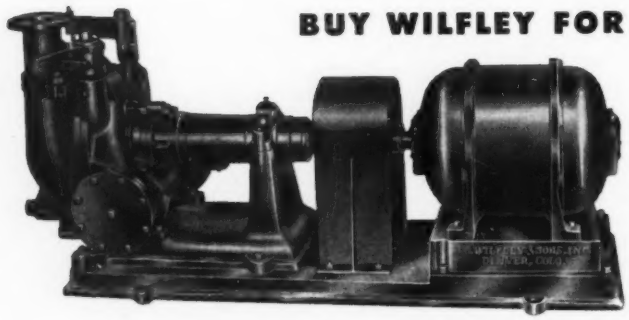
425 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; St. Louis, Mo.; Los Angeles, Calif.

Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Quebec.

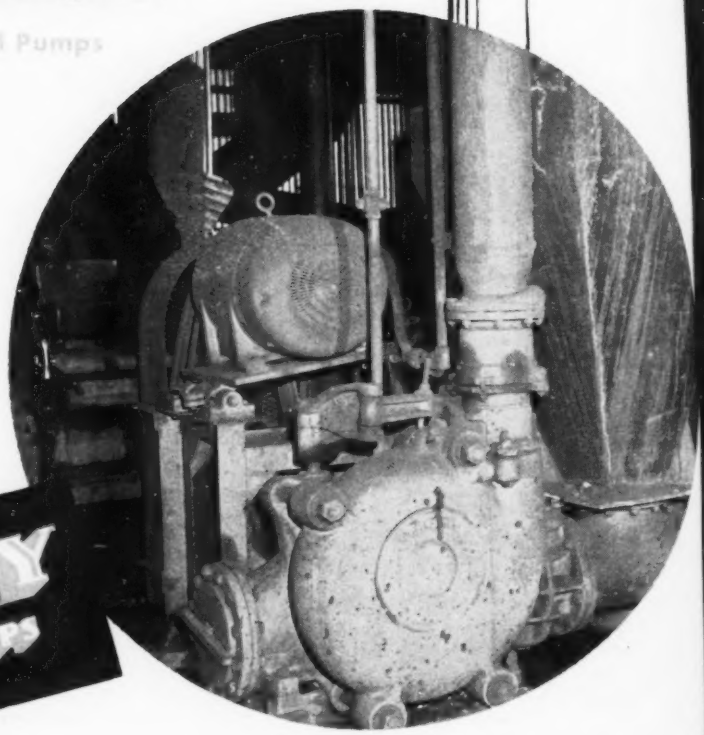
heavy media

BUY WILFLEY FOR COST SAVING PERFORMANCE



Companion to famous Wilfley Acid Pumps

This Wilfley Model K *pump is extremely effective in heavy media circuit and thickener circuit work in coal washing operations. Specifically designed for rugged, heavy duty performance, delivering continuous, trouble-free operation at low cost without media loss, leakage or dilution.*



WILFLEY
centrifugal PUMPS

In modern plants all over the world dependable, highly efficient Wilfley pumps are on the job, operating 'round-the-clock without attention. Available in sizes that meet every pumping requirement. Individual engineering on every application... Write or wire for complete details.

A. R. Wilfley & Sons, Inc.

Denver, Colorado, U.S.A.

New York Office: 1775 Broadway, New York